April 1950 25c

Organic Gardening

Gardening without Commercial Fertilizers

PURDUE UNIVERSITY
APR 8 1950
LIBRARY

Read these 3 Basic Books by J. I. RODALE

PAY DIRT

HERE is *the best guide to the organic movement.* The "bible" of thousands of gardeners, PAY DIRT points the way to proper farming and gardening methods, shows how the individual gardener can obtain bigger yields of disease-free plants, rich in health-giving qualities. Now in its ninth edition, PAY DIRT is still one of the most important books published in this country in years.

Next to the Atom Bomb, nothing else in the world is so serious as Man's ravishment of the earth that sustains him and keeps him from starvation. Even more than atomic energy, our topsoil could become beneficial to mankind if properly treated. PAY DIRT points the way to proper farming and gardening methods and is guaranteed to "give a case of the jitters to all back yard gardeners as well as . . . farmers who have been playing it the easy way by using chemical fertilizers. It will very well send them back to the compost heap."—*The New Yorker.* "Brings the all-important world problem of soil conservation into focus for the individual gardener."—*N. Y. Herald Tribune.* "An exciting book, both for the farmer and the gardener."—Richardson Wright, in *House and Garden.*

PAY DIRT is a natural for everyone who wants to adopt organiculture. Cloth, 252 pp. **$3.00**

THE HEALTHY HUNZAS

A BOOK about the inhabitants of the northwestern section of India who are astoundingly healthy because of the way they raise their food. A race of over 22,000 people, the Hunzas possess a bodily buoyancy that makes them unique among the world's national groups. Full details show how any gardener or farmer can apply the Hunza methods. Cloth, 263 pp., 20 full-page illustrations. **$3.00**

STONE MULCHING IN THE GARDEN

A NEW INVENTION in gardening! An authoritative guide to the use of stones and rocks for obtaining greater yields and healthier plants. This sensational but natural practice obviates digging, cultivating, hoeing, and weeding. Here is the most remarkable and promising cultural practice proposed in recent years. Cloth, 164 pp., 50 photos. **$3.00**

Order books on this page from
ORGANIC GARDENING
Dept. 4-G, Emmaus, Pa.

The amazing story of an organic farm

HUMUS and the FARMER

by FRIEND SYKES

TELLS how 750 "worthless acres" were changed into rich farm land by use of the organic method. Filled with graphic descriptions, illustrations, recommendations for making pastures, reclamation of waste or derelict lands, and increasing the water-holding capacity and productivity of the soil. The value of mixed farming and reforestation, the importance of the earthworm, and the mechanization of the compost method are all clearly explained.

Friend Sykes' account begins when what was regarded as one of the best herds in England proved, upon government inspection, to be 66% diseased—the result of deficiencies in the food plants. The herd was dispersed and the valuable farm land sold. Friend Sykes then purchased 750 acres of land on the Salisbury Plain which farmers round about considered practically worthless. He subsoiled it and fertilized with natural manures exclusively. Pasture and crop plants were grown which were rich in minerals and other nutrient materials.

As a result, the cattle and horses were maintained in health and vigor that had been hitherto unknown, and the land is now visited by outstanding agriculturists as one of the most interesting farms in England. 416 pages, 40 photos. **$4.50**

NOW YOU CAN ORDER FRAZER COMPOST

New Plant In Production In Famous Chicago Stockyards

Frazer Illinois Compost Plant, 901 West 45th Street, Chicago. Designed and constructed of glass covered steel by the A. O. Smith Corp., Milwaukee. This is the first of hundreds of plants soon to be licensed under the Frazer-Eweson patents to mass produce 100% organic Frazer Compost throughout the world.

Frazer Compost—first 100% organic compost to be produced in commercial quantities is now available for shipment to anyone—anywhere. So uniform it will feed through your fertilizer spreader—as easy to broadcast as grass seed! Small amount enriches large area! Odorless! Will not harm seed or burn tender roots! Stays put—will not leach! The perfect soil conditioner.

SEND YOUR ORDER TO

FRAZER ILLINOIS COMPOST CORP.
999 Exchange Avenue, Union Stock Yards
Chicago 9, Illinois

Enclosed find check.....draft.....or money order.....

..... 2 lb. Bag (postage prepaid).....	$ 1.00
.....10 lb. Bag (express collect).....	2.00
.....80 lb. Bag.....	5.00
.....Ton lots (25-80 lb. Bags).....	60.00
.....Carload lots (30 tons minimum)—Per Ton.....	50.00

ALL PRICES F. O. B. CHICAGO

Mail Orders—any size—shipped promptly

SHIPMENTS MADE IN ORDER RECEIVED

Jobbers and Dealers write for our selling plan.

Yes! YOU CAN HAVE HEALTHY VIGOROUS PLANTS THE EASY WAY with

Ko-K-O

50 Lbs Net Wt
HERSHEY'S
Ko-KO
ORGANIC SOIL CONDITIONER & BUILDER
FOR LAWNS and GARDENS
Made by HERSHEY Estates
HERSHEY, PA
STORE IN COOL DRY PLACE
HERSHEY'S Ko-KO
HERSHEY'S Ko-KO
WHAT IS Ko-K-O?
Cocoa bean shells and other parts of the cocoa bean are blended expertly and sweetened to produce a natural, organic material that will furnish a steady source of humus for the soil.

FOR LAWNS AND GARDENS

- **Apply Direct to the Soil**
- **Mix in the Compost Heap**
- **FEED TO EARTHWORMS**

An essential material for the Organic Gardener... A slow-acting, long-lasting energizer that increases and replenishes the organic content of the soil... Improves soil texture... absorbs and retains plant-nourishing moisture... helps decomposition of soil break-up into humus... binds sandy soils... loosens clay soil.

Packed in Handy 50 Lb. Bags

If your dealer cannot supply you we will ship direct to you where Pick-up and Delivery is available; if not available shipped to nearest freight station. Freight prepaid East of Mississippi River. (Write for freight rates west of Miss. R.)

NEW LOW PRICE

Send $1.00 for each 50 lb. bag; enough for 200 sq. ft. of NEW lawn or garden. Minimum Shipment 100 lbs. (2 bags)

HERSHEY ESTATES

HERSHEY, PENNSYLVANIA

Organic Gardening

VOL. 16, NO. 4 — APRIL 1950

IN THIS ISSUE

Forum		3
Editorial—The New Organic Method	J. I. RODALE	14
Let's Bring The Canna Back	CHARLES V. APPLEGATE	17
Miscellany	J. I. RODALE	18
Wild Flowers in the Home Garden	M. B. CUMMINGS	21
Building a Hardy Border	JULIE BEDIER	22
All-America Selections 1950	RAY W. HASTINGS	24
Soil and Health Foundation		27
The 4 Freedoms on the Farm	HERBERT CLARENCE WHITE	28
Easter Arrangement	MRS. PHILIP BERMAN	32
Country Estate	MR. AND MRS. R. P. FENSTERMACHER	33
Growing Strawberries Successfully with Mulches	HENRY JOHNSON, JR.	34
Vitamins, Growth Substances, Hormones to the Soil	DR. EHRENFRIED E. PFEIFFER	36
How To Grow Your Own Tomatoes From Seed	WILLIAM H. EYSTER, PH.D.	38
The New Organic Method In the Garden	WILLIAM H. EYSTER, PH.D.	40
Cancer—Part XII—Sugar (B)	J. I. RODALE	42
Pesticides and Foods		45
Garden Calendar for April	WILLIAM H. EYSTER, PH.D.	46
Hints For the Flower Garden		49
Seminar—Weeds	WILLIAM H. EYSTER, PH.D.	50
New Books		55
Readers' Correspondence		57
Hints For the Vegetable Garden		59

J. I. RODALE, *Editor and Publisher*

DR. WILLIAM H. EYSTER, *Managing Editor* — KARL MANAHAN, *Art Director*

JAMES F. BAIRD, JR., *Advertising Manager* — VERNICE KEMMERER, *Assistant Advtg. Manager*

ROBERT RODALE, *Staff Photographer* — ANN ANDREWS, *Flower Arrangement Editor*

Published monthly by ORGANIC GARDENING. Publication, Executive, Editorial and Subscription Offices: 6th and Minor Streets, Emmaus, Pa. Advertising Offices: 48 S. West St., Allentown, Pa. Subscription Rates, United States and Possessions, One Year $3.00, Two Years $5.00, Three Years $6.00. Unless otherwise directed all subscriptions begin with the current issue. Renewal subscriptions begin immediately after old subscription expires. When changing an address, give the old address as well as the new. Manuscripts should be accompanied by full return postage and a self-addressed envelope. Printed in United States of America.

Copyright 1949 by ORGANIC GARDENING.

Entered as second class matter January 27, 1943, at the Post Office at Emmaus, Pa.; under the Act of March 3, 1879.

Friends of ORGANIC GARDENING Can Help Build Circulation by Handing Out Free Subscription Booklets

Organic Gardening is constantly striving to increase its subscription list. It is important that we tell as many people as possible about organic gardening. Perhaps you would like to take an active part in this important program by handing out our subscription booklets to friends, neighbors, and acquaintances in your community. If you would like some extra money, this spare-time activity will return liberal commissions. The booklet will induce your prospect to subscribe. Through a coded coupon we can trace each subscription to your efforts.

SEND FOR FREE BOOKLETS Write to Organic Gardening, Dept. Q., Emmaus, Pa. We will be glad to send you 25 or 50 booklets. State how many you want.

COMPOST vs. NITROGEN

I raise a garden and I try to make compost the best I can with lots of grasses, weeds, and a little garbage, lime, manure (poultry, sheep and cow purchased dry in small bags), vegetable tops, and any sweet clover I can get, and wood ashes when I have them. I get leaves from town and lug them home in full sacks, and this year I have some pretty good leaf mold. I am spading leaves in the ground as fast as I can.

I see the weeds seem to help where a field of spuds are maturing, by shading the soil. I have always kept my garden free of weeds, but next year I plan to try to cover the ground with compost to protect it from the heat.

So far I have not had enough compost, in spite of my two great piles, as ⅔ of my garden is 98% sand. I intend to sow a cover crop of rye or rye grass. No more bare ground to wind erode for me if I can help it.

I like gardening and chicken raising and have singular success. But I have always had to work hard at it.

One thing was noticeable, the carrots were coming up but the tiny plants disappeared. Then I had an inspiration. I spread a light sprinkling of fine compost over the rows and in a few days could distinguish the rows. I gave them another sprinkling, continuing this until they were good sized.

We have a neighbor who has what you call black bottom land that was marshy or swampy before I plowed my two lots and she turned hers. She won't make compost, and plants it very heavily. It surprises me she gets anything at all, with all the weeds, but she does.

She bought 100 pounds of Nitro-

Approved by professional engineers.

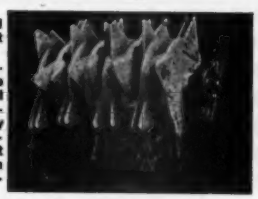
Keston ORGANIC SHREDDER

Patent Pending

Shreds every kind of plant material to small particles for Indore, Quick, or sheet composting and mulching. A Mixer also. Ideal for OLD and NEW Methods. Inexpensive, efficient, rapid.

***Only* $125** ½ h.p. G. E. Motor $34. or 1½ h.p. Briggs-Stratton Engine & Clutch $44. extra. Terms cash. F.O.B. Factory N. J.

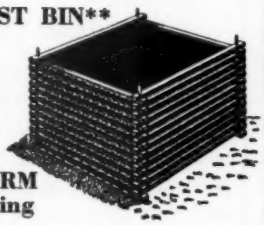
Portable— Handles and rubber-tired wheels—at small extra cost



Shredder is based on improved cutting principle with 80 case-hardened steel knives for all-purpose grinding, wet, dry or decayed materials. Fafnir sealed bearings. Built and guaranteed by high class equipment manufacturing company.

COMPOST BIN**

LEHIGH TYPE— Smoothly sanded oak and hard maple. Steel corner rods. 1-ton size $10.00; 2-ton size $15.00.



EARTHWORM Culture-casting Cabinet**

An electric cabinet designed so that the castings are deposited in a separate moist chamber. 1000-worm size $19.50.

EARTHWORMS*

Specially bred composting earthworms $6.50 per 1000.

Terms: Cash with order.

* Prepaid ** F.O.B. Factory

Add 10% W. of Mississippi.

Keston Herbal Activator* for Quick Composting. *No turning!*

Enough to activate 5 Tons.....$1.00

ENZ-BAC* All-purpose compost starter with the enzymes and composting organisms. 1-ton unit $2.00; 5-ton unit $8.00.

B-D COMPOST STARTER*

Scientifically formulated in a Biochemical Research Laboratory. 1-ton unit for $2.00; 5-ton unit for $8.00; 10-ton unit for $14.50.

HAND MILL*

For your own whole-grain flour $7.00. Also Power Models.

FULCRUM*

To convert your garden fork to no-digging. $3.50

FERTO-POTS**

2" - $2.50 3" - $3.25 per 100

Organic Implements & Products Co. PHILIP S. WELLS P. O. Box 103, Haddon Heights, N. J.

MARTIN GRANITE DUST

A NATURAL GROUND ROCK supplying 16 trace elements

This essential potash rock may be added to your soil quickly and safely to increase plant growth. The potash as well as 16 important trace elements is the product of a finely ground natural rock quarried in the heart of the well known Penna. Dutch farming section. You'll be amazed by the results obtained when you add Martin Potash rock to your compost pile or directly to the soil. The slow action involved in dissolving the potash rock makes it last for years—yet, it supplies plenty of natural minerals to your crops.

100 lbs.	$ 3.75 (F.O.B.)
per ton	30.00 (F.O.B.)
carload	26.70 per ton (F.O.B.)

Write today for full information!

BALLY SPECIALTY PRODUCTS • Bally, Pa.

GIFTS THAT MAKE A HOUSE A HOME! **AS LITTLE AS $7.95 ea.**

Weathervanes and ornamental Signs and Brackets add those personal touches that turn houses into homes. Ours come in 17 beautiful designs. Of hand wrought iron with black rust resisting finish. From $7.95 to $22.50 postpaid. "Weathercock" vane or sign $7.95 ea. Both for $14.95. "Summertime" vane or sign $18.50 ea. Both for $34.95.

Sent Postpaid, complete ready for easy mounting.

All weathervanes have roof saddle and ball swivel standard. Reflecting letters. Add 25c for each letter in name, covers both sides.

SEND 10c for illustrated catalog of Early American Hardware, Post Lamps, Franklin Stoves, Wrought Iron Railings and GIFT ITEMS GALORE. Contains 25c coupon redeemable on first order.

WILLIAMSBURG BLACKSMITHS
91 Buttonshop Road, Williamsburg, Massachusetts

$1.00 SPECIALS

HOUSE PLANTS

SAINTPAULIA AFRICAN VIOLETS
Red Head, Blue Girl, Pink Lady, White Water Lily, Plum. 6 mos. old 2 for $1

LEAF COLLECTION: 1 DuPont Blue, 1 DuPont Orchid, 1 White Water Lily, 1 BiColor, 1 Red Head, 1 Blue Eyes, 1 Plum, 1 Crinkles, 8 Leaves. $1

WICK-FED POTS
Especially recommended for watering of African Violets. Artistic—Non-breakable. All colors. 4"—$1 ea. 5"—.

GLOXINIA BULBS
from Belgium (Assorted colors) 4 lrg. bulbs $1
10 bulbs $2

Philodendron—Beautiful green leaves. Long vines. 4 for $1

PARLOR IVY
Easiest of all indoor plants. Rapid grower. Handsome green foliage. Grows in soil or water. 6 for $1

MIDGET ROSES (Swiss) Brilliant Red and continuous bloomer. Hardy outdoors, roses all winter. Fine house culture as well. 2 for $1 5 for $2

OUTDOOR PLANTS

RHODODENDRONS
Mixtures of 8 to 10 inch plants. 6 for $1

AZALEA TYPE MUMS—600 to 800 flowers first year. Hardy, large and double. Red, Pink, White, Yellow, Bronze. Plant now. 3 for $1

CANNAS
LARGE 2 TO 3 EYE DIVISION President red-Wyoming Yellow-Pink. All dwarf bedding type with mammoth flowers. 9 for $1

LILY-OF-THE-VALLEY Flowering pips, also well for shade. 50 for $1

CREEPING MYRTLE Fine for shade, embankments, or where grass won't grow. Always green. Blue flowers in Spring. 15 for $1 100 for $5 1000 for $45

AZALEAS Chinese red. Evergreen variety. Very fine. 5 for $1

ROSES
Tea or everbloomers. Under color only. Red, pink, White, Two-Tone, and Yellow. Two Year Strong Plants. 5 for $2 2 for $1

GLADIOLUS
RAINBOW MIXTURE. Probably every color different. 25 for $1

FRUIT & VEGETABLES

STRAWBERRY PLANTS
25 Early, 25 Late, 50 in all $1
Gem (everbearing) 25-$1, 100-$3.50
BLACK CAPS 6 for $1

Sensational Special
BLUEBERRIES—Rancocas, Rubel, Jersey, etc. This month only. 5 for $1 25 for $4 100 for $15

RHUBARB
Myatt's Giant 6 for $1

CRANBERRIES For real wet places. A green ground covering as well. Edible type. 12 for $1

GRAPES
1 Concord, 1 Red, 1 White 3 for $1

Add 15c to each purchase for package & post. up to $5. Over $5 postpaid. No C.O.D.'s.

SHADY LAWN NURSERY, Inc.
Dept. O Hammonton, N. J.
Sorry, no catalog

Kill Moles
WITH A
NASH TRAP

The safe, sure way. Can't poison soil. Saves your earthworms. Used by all informed mole control specialists. At dealers, or direct, $2.50 postpaid. C.O.D. fees extra. FREE—Mole control pamphlet. Nash Mole Traps, 164 E. South, Kalamazoo, Michigan.

NASH Choker Loop TRAPS

gen. It also read "plant food" and "sodium nitrate" on the bag. I said, "That is the stuff they tell us not to use in the *Organic Gardening.*" She pointed to the words, and yelled at me, "Plant food, plant food." I realized it was useless to argue. So I went home, and she put it on thick, and it worked all right. But it did not work the way she expected. It burned up the whole patch of strawberries. Three hundred plants.

E. E. Cromer
Box 2514 St. Anthony Falls, Br.
Minneapolis, Minn.

—o—

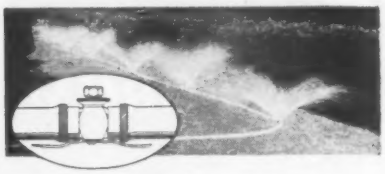
LAMB'S QUARTERS FOR HEALTH

In your October issue of *Organic Gardening* you state that lamb's quarters are host to a leaf miner which attacks other plants in the garden. Despite the bad reputation that you give lamb's quarters, it is one of the most nourishing, flavorsome, corrective, and inexpensive of leafy foods. Volunteering lush and verdant wherever the ground is stirred, it does not ask for stimulants, nor hesitate for the hoe. It is the modern analogue to that manna that sustained Elijah on his adventure into the desert. All the gardener needs to do is to stretch forth his hand, take and eat, uncooked, steamed, canned or dehydrated.

It was highly esteemed by the Maori and their kindred as a food, and when made into a drink. That race in the heyday of their vigor, before being exploited and despoiled by the devastating whites, were the most comely, powerful and happy of native peoples.

The Welsh made the leek their national emblem, when they were a nation. It would be well for the costive, constipated, liver sick, autointoxicated American addicts to catharsis to make lamb's quarters (*Chenopodium album*)their emblem and pay tribute to it on their luncheon and dinner tables. They might then be freed of their bondage and

scientific watering!



AMAZING, NEW
SPRINKLIT
5 sprayers on 1 hose
Completely waters flower beds, shrubs, trees, narrow strips, irregular shaped areas. Covers 1 to 1000 sq. ft. Sprayers turn on and off individually; flow adjusted at faucet from full volume of fine spray down to soaking volume. *Utility hose* with sprayers turned off. 50 ft. Goodrich plastic hose; 5 solid brass sprayers. Weighs only 8 lbs. 5-year guarantee.
Order Now—in time for hot weather.
Goodrich Koroseal Plastic—$17.95
Goodrich Ribbed Plastic —$14.95
(Plus Postage—50c E. of Miss.; $1. W. of Miss.)
SORRY NO C.O.D.'s
HOWARD SALES CO.
1650 C Belmont Ave. New Hyde Park, N.Y.
Dealer Inquiries Invited

Orlyt GREENHOUSE
This Model— $395
ALL ORLYT PRICES REDUCED
Including Greenhouses with Straight Sides and Lean-tos
Simple to put up anywhere, any time. Sections go together with bolts and screws. No cutting, fitting, or putty glazing. $395 buys the 10 by 11 ft. Orlyt pictured ready to go on your foundation. Others from $175. Automatic heat and ventilation at reasonable prices. Ask for Booklet No. 27.
LORD & BURNHAM
IRVINGTON N. Y. • DES PLAINES ILL.

For your garden's sake **IRI-GATE**

With The New
IRI-GATOR
Make your garden more beautiful by scientifically watering where it does the most good—AT THE ROOTS. Recommended by leading horticulturists, the IRI-GATOR changes destructive water pressure into a gentle, penetrating flow which gives deep-root watering without soil erosion or plant damage. No wet leaves to invite disease. Sturdy, rust-proof, fits all garden hoses. *Tested and approved by Men's Garden Clubs of America.* 100% guaranteed. Order yours today!
De Luxe Model—Red, green, or yellow anodized aluminum—$1.50 postpaid
$1.00 POSTPAID
THOMAS MANUFACTURING CO.
3520 E. Monte Vista Box OG 1 Tucson, Ariz.
Quantity Prices to Garden Clubs & Shops

become candidates for what certain enthusiasts call, "Glorious Health."

In closing I want to say that *Organic Gardening* is becoming increasingly indispensable to all who are striving to dispel the dark cloud that now threatens the sun of life in the civilized world.

G. M. Hawkins, M. D.
Route 1, Box 143
Puyallup, Washington

—o—

SUNFLOWER SEEDS

After reading Mr. Rodale's booklet on "Sunflower Seed—The Miracle Food" and having had severe eye trouble for many years, I decided to try the seeds.

I ate a good sized handful each day and in about two weeks noticed a definite and almost unbelievable change. The strain, ache and pain almost completely disappeared, and I could work the entire day and not be conscious of any trouble.

An eye specialist (one of the best in New England) after an examination stated my eyes had improved and prescribed weaker lens.

I also noticed my hair became oily where before it had been dry and brittle.

Sunflower seeds have been a God-send, and I heartily recommend them to all who have similar ailments.

I, personally, am grateful to Mr. Rodale for his most informative booklet, and the consequent help derived.

Ralph D. Baker,
923 Pleasant, New Bedford, Mass

—o—

NEW ROSE-BUDDING TECHNIQUE

A new Budding Technique has been evolved at the Brownell Rose Research Gardens in Little Compton, Rhode Island, that enables rose growers to improve their budding takes from about 75%, which is said to be the average of first bud-

BETTER COMPOST BETTER SOIL

Prettier Flowers; Superior Vegetables and Fruits

Never Before A Product Like This!

- **Makes activated soil builder in 2 to 5 weeks!**
- **Encourages valuable earthworms.**
- **Induces enzyme action.**
- **Converts garbage into humus without odor!**
- **Activates and conditions soils! Aids mushroom growing.**
- **Energizes hot beds; even makes hot beds without manure!**
- **Converts waste into wealth at lowest cost—Nature's own organic, bacterial way!**

Every gardener wants pretty flowers, lush lawns, more healthful vegetables and fruit. Wise organic gardeners know that the best and easiest and cheapest way to better gardens is thru compost-fed soil... that garbage makes richest humus... **THAT LEAVES ALONE ARE SUPERIOR IN FERTILIZER VALUES TO MANURE!**

But formerly it often required months or years to build rich soil. *Now,* with *ActivO,* you can convert choice compost into fertilizer in as short a time as 2 weeks! And WITHOUT ODOR!

DON'T BURN LEAVES or throw away a cob or cornstalk or chicken bone! Use even sawdust and lint. Compost all such vegetable and animal waste with **ActivO,** the odorless, organic way. So easy, quick and low-cost! **No manure needed...** But composting is just one valuable use for ActivO:—

SOIL ACTIVATION: Use it to activate, condition and sweeten soil directly. Peps up sluggish soils. Try it!

HOT BEDS: Improve heating and nutrient release. Actually makes hot beds without manure!

HELPS OTHER AMAZING WAYS: ActivO reduces odor in outdoor toilets; converts the waste into an odorless, easily handled, ash-like soil builder.. **Mushroom growers** use it to aid nutrient release... It solves disposal problems for **canners, seedsmen, rabbit, poultry and dog raisers**—and for CITIES and INSTITUTIONS, saving taxpayers' money.

All this with organics! ActivO works **exactly like Nature** in turning organic matter into humus, **but many times faster**—the result of an unusual discovery in selecting strains of energetic organisms — scientifically propagated into billions, and packaged in moist soil-conditioner—**READY TO GO TO WORK FOR YOU ANY MONTH OF THE YEAR...** ActivO isn't an herb concoction; doesn't destroy earthworms or upset soil bacterial balance.

GARDENERS PRAISE IT! Tell how vegetables look and taste better... how beautiful flowers grow where nothing would grow before... A Missouri gardener writes, "Soil is 'cinders'. Had very dry summer, with hot winds in July. But had used ActivO compost ... all crops look good; and dug 1½ bushels best potatoes in neighborhood from space only 15 x 12."

Another enthusiastically tells, almost unbelievingly, how he composts large quantities of manure, in a city backyard; without odor! Still another makes fertilizer in his basement, from **garbage.**

You will want to try this unusual product. Get some ActivO **today. TRY YOUR LOCAL OR CATALOG DEALER FIRST.** If your regular dealer doesn't have it, use coupon below. **Don't accept substitutes!** There's only one ActivO—only one organic bacterial product like this. Insist on "Act-tive-Oh!"

EXTRA!

GIVEN— *Special Premium Award*

At no extra charge, with each order for a No. 25 size ActivO ($6.99) which treats up to 3½ tons of compost, we'll be happy to mail PLANS for building the popular **A-1 Composter Cabinet** like picture—blueprints with materials list and instructions. An ingenious way to turn garbage and waste disposal into garden profit. Odorless, continuous process.

☐ **Check here if you want plans and No. 25 size ActivO, $6.99, prepaid.**

MAIL TO → **BENSON-MACLEAN PLANT PRODUCTS, Bridgeton 34, Ind.**
(Northeastern states, address ActivO—SOILSERVICE, Box 131, Townsend, Mass.)
(West Coast, ActivO-West, Box 745, Reseda, Calif.)

Inclosed is ..... for $..... Send the following:
Add 10% West of Rockies

☐ **FREE literature; ActivO and composting.**

☐ **No. 2 trial size ActivO, for 425-450 lb. compost, at $1.00 ea. postpaid.**

☐ **No. 7 size, 1350-1700 lb. compost, at $2.00 ea. postpaid.**

☐ **No. 50 size, for 6½ tons, $11.95, freight collect, (free Cabinet plans).**

Prices do not include state sales taxes.

SHIPPING POINT If different from P. O.

NAME .....

ADDRESS .....

P. O. and State .....

Dealer's Name .....

And Address .....

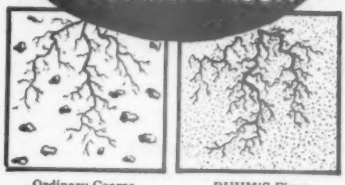
MORE THAN A COMPOST HASTENER!

"ACTO" in Canada

ACTIVO

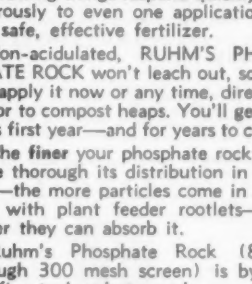
Why You Should Insist on

RUHM'S
Finer Ground
PHOSPHATE ROCK



Ordinary Coarse Phosphate Rock — RUHM'S Finer Ground Rock

- Flowers, grass, vegetables, grains—all growing things respond quickly and vigorously to even one application of this safe, effective fertilizer.
- Non-acidulated, RUHM'S PHOSPHATE ROCK won't leach out, so you can apply it now or any time, direct to soil or to compost heaps. You'll get results first year—and for years to come.
- The **finer** your phosphate rock, the more thorough its distribution in your soil—the more particles come in contact with plant feeder rootlets—the easier they can absorb it.
- Ruhm's Phosphate Rock (85% through 300 mesh screen) is by far the finest phosphate made.



Ruhm's Gives the Best Results

For Price, Full Information write

AUSTIN FEED AND SEED CO., Chattanooga, Tenn.
BRYAN & SHEFFER, Portland, Ind.
ENGLEWOOD FARM-NURSERY, R-5, Muskegon, Mich.
A. GRAMS AND SONS, LaCrosse, Wisconsin
J. E. HARRIS, Box 28, Ames, Iowa
SOILSERVICE, Townsend, Mass.
VAUGHAN'S SEED STORE, Chicago 6, Illinois

RHODODENDRONS

RHODODENDRON maximum seedlings
6 - 9 inch per 10—$1.25, 25—$2.50, 100—$10.00
9-12 inch per 10—$1.50, 25—$3.50, 100—$12.00
18-24 inch cut back clumps B. & B.
each $1.75, 3—$4.00, 10—$15.00

AZALEAS Native Flame Cut back clumps
18-24 inch B. & B. each $1.00, 3—$2.80, 10—$8.00
2-3 ft. B. & B. each $1.25, 3—$3.80, 10—$11.00
3-4 ft. B. & B. each $1.50, 3—$4.20, 10—$13.00

LEUCOTHOE CATESBAEI, Drooping Leucothoe
12-18 inch two or more leaders
3—$1.00, 5—$2.25, 100—$20.00
18-24 inch clumps B. & B.
Each $1.50, 3—$4.20, 10—$13.00

TSUGA CANADENSIS Hemlock, seedlings
9-12 inch per 100—$5.00, per 1000—$40.00
12-15 inch per 100—$8.00, per 1000—$60.00
15-20 inch per 100—$8.00

All prices F. O. B. our shipping point.
ORDER EARLY. LIST FREE.

ELK RIVER NURSERY
CARDERVIEW, TENNESSEE

ding throughout the country, to over 90%, thereby saving the grower some $3000 from each 100,000 rose bushes grown.

The new technique is based on the principle of controlling the temperature and humidity of the material budded in, to assist in the healing process. This new Brownell Technique is under patent application. Those rose growers desiring to use this device without charge may obtain particulars by writing to the Brownells.

Walter D. Brownell
Brownell Rose Research Gardens
Little Compton, Rhode Island

—o—

IN THE SHADE

It is eight years now since Mom and I moved out here, the tenants on the second floor of a house on the outskirts of the city. Having a garden was the lure that attracted us to live in the sticks. We are using part of the lot next door for our garden. The owner, having grabbed the half in the sun, mine is on the north side of the house, with trees on the west and north sides. The only direct sun I get is from the east at dawn, and it doesn't stay long. What I lacked in experience I more then made up in enthusiasm. Besides, I had the landlord, an expert on garden matters, to help me out.

This was when I was first introduced to the mysteries of 5-10-5 and 2-8-2 and sulphuric acid, phosphates, mole bait, rat killer, etc., etc. Why, I even went to lectures here at a great plant research institution we have in Yonkers and heard the learned doctors advocating the use of commercial fertilizers as strictly essential to good garden practices. Well, the bugs and I wore each other out the first three years. And it was the third summer of gardening about the time it had developed into a race between the bugs and me as to who was going to get the beans. Then I found in the mail box a little foldrace between the bugs and me as to every word of it over a few times and

PLASTIC FOR PLANT PROTECTION

Available for Window Boxes, Home Gardens, etc. Clear Transparent Plastic Raydomes permit inspection of seedlings and plants without removal. Experimental tests over a two year period show Plastic Raydome Caps will last over several seasons and seeds mature 6 to 8 days earlier due to controlled moisture and increased temperature of at least 15 degrees. This assures germination and earlier maturity. They also provide excellent protection against heavy storms, insects, etc.
Each Raydome is carefully designed with a series of indented steps that diffuse the sun's rays, stiffen the Raydome to insure long life and service, and allow nesting for convenient storage.

Send for sample order today.

1 Doz. No. 745 Raydomes 7" size
$3.00 per sample dozen price
1 Doz. No. 1065 Raydomes 10" size
$5.40 per sample dozen price
1 Doz. No. 48745 Raydomes 48" size
$23.40 per sample dozen price

Send for 4 page Raydome Bulletin No. 502

General Plastics Corp.
1400 North Washington Street
P. O. Box 747
MARION, INDIANA
Phone 4870
West Coast Office:
2377 California Ave., Long Beach 6, Calif.
Phone 4-1710

ROTOTILLER OWNERS

With the
AUTOMATIC DRIVES
Installed

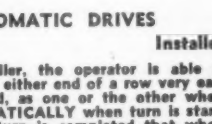
on your rototiller, the operator is able to make a turn at either end of a row very easy with ONE hand, as one or the other wheel FREES AUTOMATICALLY when turn is started and when turn is completed that wheel locks into POSITIVE forward driving position and both wheels drive forward till another turn is started. The "Hard-to-Stop" Model B1-6 can be stopped on "The Spot" when equipped with Drives. Rototillers equipped with reverse units, will turn under their own power by pulling the reverse lever into reverse position. Transmission oil leaks can be permanently stopped with our special oil seals if installed in connection with Automatic Drives. For descriptive literature see your local Rototiller dealer or write direct to

AUTOMATIC DRIVE CO.
P. O. Box 555 Saginaw, Mich.

TEXAS GREENHOUSE COMPANY
offers you the
Ezyrected **GREENHOUSE**

YOUR KEY TO GREATER GARDENING PLEASURES

in several models and sizes



Send for catalog. Discounts to Florists.

814 Dan Waggoner Bldg.
FORT WORTH, TEXAS

my thoughts went back to a boyhood spent in Scotland. They didn't know anything about fertilizers in those days. In fact, they didn't appear to know about the bugs either, which brings to my mind that radio program, "It Pays To Be Ignorant." Well, I liked what I read in the folder. It had a lot of good sense and I lost no time in subscribing to *Organic Gardening*. I started making compost. I found a millionaire-endowed Orphanage here kept a large herd of cattle for fresh milk for the orphans, and I could buy manure at fifteen cents a bushel. I got ten bushel for my compost, another ten bushels I put directly on the soil in the fall, and five pounds of rye grass seed. All I use now is compost and bone meal. I am the only one around here who can raise head lettuce. And, brother, I haven't seen a beetle on these beans for three years. The taste of the vegetables is delicious. Two years ago when everyone's tomatoes had the blight mine were free of it. And the soil, I turn over a couple of spadefuls and I have all the worms I need for fishing. Root crops I grow, but no size because of lack of sunshine. My garden instructor has long since stopped pitying my ignorance. He now accuses me of having a green thumb. He can't get over the trick I played on him this year. I told him not to buy anything this spring as I was growing enough for the two of us, and I had the pleasure of seeing his plants wither and die on his flea bitten lot. Now he wants the dope, as he calls it. I gave him a verse out of the good Book, "Having eyes they see not, having ears they hear not". You see what I am doing, go then and do likewise. Friends come to the house and they see my stack of *Organic Gardening* and, now *Organic Farmer*, then look out at my postage stamp size garden. They say, was it worthwhile? To which I reply, the cost was dirt cheap. What I have learned money can't buy. For what I have raised from that little two by four plot of soil is going to stand me in good stead, when Mom and I,

BCA

BACTERIAL COMPOST ACTIVATOR

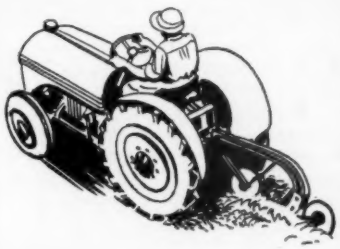
A REVITALIZED BACTERIAL CONCENTRATE THAT WILL ENRICH YOUR SOIL, INCREASE GROWTH, AND HASTEN COMPOSTING.

- **B. C. A. is a mixed concentrated composite containing a multitude of soil bacteria developed specifically for the rapid breakdown of mixed organic wastes in the compost heaps, on the soil, and in compost boxes.**
- **B. C. A. has phosphate rock incorporated in the culture which contains the 26 necessary minerals. Enough phosphate rock is in the Activator so that adding it separately to the heap is not necessary.**
- **B. C. A. contains the trace elements lacking in many soils and so necessary for best results.**
- **B. C. A. is a neutral culture prepared with conditioning food for the bacteria in a rich peat base.**

SPEED UP COMPOSTING *WITH* B. C. A.

In your house, in your garden, and on your farm, there is nothing more valuable than B. C. A. Quality compost in less time is now a reality. Both new and old method are enhanced by the use of B. C. A.

B. C. A. can be used with great success in the New Sheet Mulch Method of Fertilizing. Applied directly to the soil mixed with raw organic matter, B. C. A. will speed up the break-down of the mixed wastes.



HOUSE PLANTS WILL GROW WITH AMAZING ZEST WHEN YOU ADD A SMALL AMOUNT OF B. C. A.

B. C. A. may be added directly to house plants for increased growth, more luxurious blooming, and richer color. Just a small amount of B. C. A. planted around each seed or a thin covering on the soil of potted plants will produce amazing results. B. C. A. helps regulate moisture and air in the soil.

B. C. A. is excellent for the increased growth and rapid reproduction of earthworms.

ALL ORGANIC — NO CHEMICALS

Due to direct distribution—no dealer profits—we can offer you the low prices listed below—

ORDER ALL PURPOSE **B. C. A.** TODAY TO ASSURE MAXIMUM USE

ORGANIC PRODUCTS, Dept. G4
235 Halsey St.
Newark 2, N. J.

Gentlemen:

I enclose check or money order for the following:

☐ **5 lb. size ($2.00 postp'd). For approx. 2 tons compost or an average garden.**
(West of Mississippi, $2.50)

☐ **15 lb. size ($5.00 postp'd). For approx. 6 tons compost or a large garden.**
(West of Mississippi, $6.00)

☐ **More information (FREE) concerning B. C. A.**

Name .....

Address .....

City ..... **State** .....

ORGANIC Elements
FROM THE SEA...
bring you
GARDENING
SUCCESS!
WITH
BIO-GRO
THE ONLY TRUE
LIQUID FISH
FERTILIZER and ORGANIC
PLANT FOOD
● Promotes Growth of FLOWERS, LAWNS, BUSHES, VEGETABLES, POTTED PLANTS..
● CONCENTRATED—Ready for Instant Use...
● Has NO UNPLEASANT ODOR!
You'll be amazed at the way your growing things thrive on BIO-GRO! It's absolutely NEW; a liquified organic fish fertilizer with added micronutrients. Nutritionally complete—neutral in pH—absolutely SAFE for all plants. ECONOMICAL, too. One pint makes 40 to 100 gallons of nourishing, pure liquid plant food.
You can get BIO-GRO from most seed stores; or order by mail. Pint cans $1.00; quarts $1.50; or half-pint trial size 60c—all postpaid. Write "Bioproducts, Dept. B."
ORDER NOW!
Make this year's garden your finest ...with BIO-GRO!
MANUFACTURED BY
BIOPRODUCTS Oreg Ltd
WARRENTON, OREGON

If you are interested in J. I. Rodale's articles on cancer, read **"The Healthy Hunzas".** This informative book describes a race of cancer-free people in the northwestern section of India. Your eyes will be opened when you learn the important part farming plays in the health and prosperity of the world. Written by J. I. Rodale, this clothbound book sells for **$3.00** postpaid. ***Send for your copy today.***

ORGANIC GARDENING
Dept. 4-G, Emmaus, Pa.

at the age of 65 years, retire to the little farm in the country.

Wait till I get out in the sun.

David Wilkie,
Yonkers, New York

—o—

PEAS AND CORN THE ORGANIC WAY

I received the August, September and October *Organic Farmer* Magazines day before yesterday.

I raised peas this year—my wife says she did—just the common field kind similar to a blackeye, except they are browneyed, on poor white sand—about 5 feet deep. If this land has ever had any commercial fertilizer on it, it was a long time ago. I've owned it 25 years and it has never had any kind of fertilizer in that time except once or twice a year the weeds and grass disced into it to eliminate fire hazard.

These pea vines were large and vigorous, looked as if they had 200 pounds of nitrate of soda per acre under them—though not one bit was used—and they made plenty of peas. (They weren't planted in the right time of the moon either).

This isn't the first time we've grown peas this way. We have six acres of land and we have four or five rows somewhere on the place every year.

I'm just wondering if peas grown as these would have all the "vitamins," trace elements, etc., that they should. We have had this particular variety of peas seven or eight years. We save seed from them every year and the germination is so close to 100% that you would have to use a seed tester and count every seed to be sure it wasn't 100%.

Four or five years ago on this same type of land I planted some corn for roasting ears. My wife fertilized it with Vigoro—about 1,000 lbs. per acre near as I could guess from what she told me—it made wonderful looking corn equal to that grown in any river bottom. It was so fine looking that the "boss" picked some of the

New Life for Gardens

Q. R. Compost-Maker changes all vegetable waste in a few short weeks into rich, sweet-smelling compost with a thriving worm population which ensures soil yielding bigger, better crops and lovelier, finer-scented flowers. Its results are really remarkable.

PURELY HERBAL—NO CHEMICALS

For economy of time, cost and labour Q. R. is unrivalled and its use may be profitably continued without fear of ultimately impoverishing the soil.

NO TURNING NEEDED WITH Q. R.

"The compost made with Q. R. brought most gratifying results in our garden and we are very enthusiastic about it". (Ohio).

"Q. R. has given marvellous results with our Gladioli, Delphiniums, Bench Roses, and particularly with Strawberries". (Minneapolis).

TESTIMONY FROM ALL OVER THE WORLD

QR
HERBAL ACTIVATOR

Special Offer to Readers

To encourage you to try Q. R. we are supplying a large Package.

Special Price **$1.00** Post Paid

Obtainable from JAMES S. WELLS
P. O. Box 45, Deerfield, New Jersey

Proprietors and Manufacturers:
CHASE LTD., CLOCHE HOUSE, SHEPPERTON, ENG.

ORGANIC SUPPLEMENTS

TO increase the NPK of your garden organically, we offer the following supplements—

For Nitrogen (N)
DECOMPOSED ORGANICS—an excellent plant food containing nitrogen fixing organisms.

For Phosphorus (P)
BONE MEAL & RAW PHOSPHATE ROCK—finely pulverized natural rock phosphate.

For Potassium (K)
ORGANIC POTASH—a natural organic derived from an organic ash. No acid or acid reactive substances.

These products may be ordered separately, or blended into a well balanced plant food. Each item contains many of the trace elements so essential to your soil.

Write today for full information!

ORGANIC PLANT FOOD CO.
P. O. Box 132 **Lancaster, Pa.**

finest ears and saved them for seed (We'd had this corn and saved our own seed for three generations).

Next spring I was out of town, but at the regular and appointed time the Missus planted her corn.

About one grain in twenty came up. When she complained about it, I told her maybe the moles got it. She said, "Nothing doing, I dug into it and it's all there; two grains in a hill just like I planted it, but it's rotten."

I went out and looked around in the field where the same kind of corn was grown with no fertilizer and made about one-half – maybe one-third as much corn per acre, and found a few "nubbins" that had hung on the stalks all winter. The corn from these was planted in the "middles," between the rows of the first planting and it germinated 100%—planted in hills, two grains to a hill.

It is my opinion that so far as feed value would be concerned, the one-half amount from the second plot of ground—both same size—would be greater than the feed value of three or four times as much from the first fertilized plot.

Sometime in the next two or three years, if I live, and am still able to eat and walk around, I intend to retire, get myself a farm somewhere and proceed to put into practice the principles practiced by my Daddy and Granddaddy. Dad would be nearly 101 years old were he living and Grand Pop 120 this year – plus what I've learned from *Organic Gardening* sources.

I'm too old—63—to do more than just prove some things I'd like to spend the balance of my life doing. I don't expect to make any money out of it.

Many thanks for the stand you've taken on the organic question. I knew a good deal from memories of my boyhood but I'd been so long away from such contact—nearly 35 years now—that I'd forgotten in a way all about it. But reading your magazine sent memory scurrying back 40 and 50 years and more; and gradually all the things and ways that my Daddy used have come back.

He didn't compost the manure as

Gladiolus

100 Bulbs only $1.69

Imagine! GLADIOLUS BULBS at less than 2c each! Assortment from flaming reds, yellows, purples, blues, pinks, whites, peach, multicolor, etc., now ready for first blooms and with many years of flowering ahead. Any bulb not developing first planting replaced free. Tremendous saving in these young virile bulbs already 1½" to 2¼" in circumference. Truly an unbeatable offer. Order now on approval.

EXTRA—3 TUBEROSES—SEND NO MONEY

On arrival pay $1.69 plus C.O.D. postage on satisfaction or money back guarantee! 3 TUBEROSES included extra. Bloom into tall waxy white flowers 2-3 ft. tall, extremely fragrant. A sensational bargain.

MICHIGAN BULB CO., Dept. GW 1851 Grand Rapids 2, Mich.

Little Farmer

powered cultivator

$94.50

F.O.B. ORRVILLE, O.

At last, an effective powered cultivator in the low-price field. LITTLE FARMER is ideal for city or farm garden use. Compact design and fine balance make it easy to operate. Just right for narrow rows where larger equipment may damage plants. Write NOW for complete information. Dealer inquiries also invited.

The Wilt-Burt Co. ORRVILLE, OHIO
Department O

Large healthy 3- to 4-year-old, 6- to 14-inch trees. 10 ea. Blue Spruce, Norway Spruce, Red Pine, Scotch Pine, Mugho Pine. Sent postpaid at planting time. Evergreen catalog; write Box 15-D

50 Trees for $5.00 Postpaid

MUSSER FORESTS, INC., Indiana, Pa.

EFFECTIVE AID FOR LAZY GARDENS

***New, Organically Balanced Plant Food helps develop* HEALTHY**

With ESPOMA, the *scientifically compounded* blending of material in various stages of decomposition, you get a concentrate that provides (1) Immediate, and (2) continuing benefit throughout the growing year! ESPOMA may be applied direct to soil, or added to composts. Contains no filler or chemicals . . . will not wash out of soil, but remains to aerate and add bulk. Encourages earthworms and helpful bacteria.

100% PURE ORGANIC

BALANCED SCIENTIFICALLY

ESPOMA contains King Crab, Poultry Manure, Bonemeal, Castor Pomace, Cocoa Tankage, Fish, and other organics. Contains vitamins and hormones. Neutralizes harmful soil conditions, gives soil highest moisture-retaining capacities, *makes soil rich in plant foods.*

- √ VEGETABLES
- √ LAWNS
- √ SHRUBS
- √ TREES
- √ FLOWERS
- √ ROSES

ORDER BY MAIL
100 lbs. $ 3.95
500 lbs. $18.00
1000 lbs. $34.00
2000 lbs. $60.00
f.o.b. Millville, N. J.

ORDER FROM THIS AD • *Write for Free Literature*

Send Cash, Check or Money Order – **THE ESPOMA CO., Dept. F, Millville, N. J.**

Pioneers in Organic Processing Since 1929

ESPOMA PLANT FOOD • SOIL CONDITIONER

Earthworms

(Domesticated)

The Soil is now awakening from its Winter rest. It's starting production of food and flowers.

You can—instead of being a destroyer by use of artificials—help Nature in replacing the elements she has given up by composting waste materials such as leaves, grass-clippings, weeds, etc.

Earthworms play an integral part in converting waste into valuable manure. Have them help YOU to help Nature in providing for YOU and YOURS.

400-500 Earthworms $2.75

FREE BOOK—Leaves and what they do.
or Compost, how to make it.

800-1000 Earthworms $4.75

FREE BOOK—The Compost Gardener.
or Our friend the Earthworm.

1200-1500 Earthworms $6.75

FREE BOOK—Grow a Garden and be self-sufficient.

Full instructions with each order. All orders prepaid East of Mississippi River. Add 10% west thereof.

Send for free copy of recently written treatise on EARTHWORMS.

ORGANIC GARDENS
Fullerton, Maryland

PERENNIALS

Organically Grown
Our get acquainted selection

10 Plants - All different $3.00
List value over $4.00

20 Plants - All different $5.00
List value over $6.50

GLADIOLUS

A Select Mixture in Many Colors
Large Bulbs

50 - $2.50 100 - $4.00

All orders Post Paid

Send for complete list of Plants and Bulbs.

ORGANIC GARDENS
Fullerton, Maryland

WEATHERVANES
FREE CATALOG SHOWING MANY DESIGNS IN VANES AND SIGNS. HORSE ILLUSTRATED 19" x 20" ALL COPPER. ONLY $8.95 POSTPAID. ROOF PLATE FURNISHED. PROMPT SHIPMENT MONEY BACK IF NOT PLEASED.
CAPE COD WEATHERVANES
DEPT. N NEW BEDFORD, MASS.

you do now, but practiced what you call sheet composting. The manure was spread on the ground in a tolerably fresh state and plowed under within a few hours. This was done all summer and early fall. About October or November the ground was plowed again and seeded to oats. These were grazed in January, February and disced down and plowed under in March, usually followed with corn or Sudan grass for hay.

This process was alternated here and there and about over the place from year to year giving each "patch" of ground its turn, with the heaviest applications of manure going to the "patches," where vegetables—tomatoes, lettuce, cabbage, etc.—were to be grown.

We also grew oranges and peaches — peach varieties adapted to our southern climate—but no fruit trees were planted on ground that had had any manure applied within three years, because of possible root disease. I forgot to mention figs; we grew these, too.

As far back as I can remember, Dad always started out with virgin land. I suppose he wouldn't buy any other kind, but I don't remember his saying anything about it.

But after one crop, the manuring started as related. On one occasion we planted five acres of oranges on new ground—following one crop—no manure was ever put on this as well as I remember, but the second year it was seeded to burr clover; in the spring time this was a mistake, rye or oats would have been better, as in about four years the soil was so rich and the trees so lush that a severe freeze cleaned them out "root and branch" while trees not far away which had never had any fertilizer or organic matter of any kind survived, though after the new soil was exhausted, they never bore much.

I remember one year — 1906 — we sold $90 worth of cucumbers from one-half acre of ground. The buyer wouldn't take anything shorter than four inches, nor longer than six inches. He paid us 60 cents per hun-

STRAWBERRY PLANTS (POT GROWN)

Immediate Delivery

We supply heavy-rooted, POT-GROWN plants that will fruit THIS summer. Grow them organically for the tastiest berries you have ever eaten.

Suburban Garden Collection

70 June Bearing Plants
30 Everbearing Plants
ALL FOR **$13.25**

Home Garden Collection

35 June Bearing Plants
15 Everbearing Plants
ALL 50 **$6.95**

Our 56-page, color catalog FREE with each order. Describes Seeds, Bulbs, and Plants, including 16 of the newer and better varieties of strawberries.

BURNETT BROS., INC.
Dept. B 92 Chambers St. New York 7, N. Y.
Est. 1905 BArclay 7-6138

THE

1950 HANDY-TRAK

only **$135**

Power!
Balance!
Pivot turns!
Traction!

A Combination Of Quality And Economy!

The only small one wheel tractor that will plow efficiently! The accessories for this versatile, 142 lb. tractor include plow, harrow, cultivator, riding sulky, lawn mower adaptor, etc., all of which are attached quickly with a drop pin. For descriptive literature, write:

GARDEN MACHINES CO.
HADDON HEIGHTS, N. J.

SOILBUILDER ORGANIC FERTILIZER

BAG SIZE—
35 lbs. - 37x22 in.

Contains meat scraps, bonemeal, blood, and composted vegetable matter. 100% organic

- **NO FILLER**
- **HEAT STERILIZED**

Will not burn—will absorb 8 times its own weight of moisture—high in trace minerals. Packaged in 2 lb. and 35 lb. bags. If not available at your local dealer send for literature or ask your dealer to write us.

SOILBUILDERS INC.
Box 176 So. St. Paul, Minnesota

dred (100) pounds delivered to his shed.

These days when I go into "Supermarkets" and see the hooknecked culls and trash offered for 15 cents to 20 cents per pound, I wonder what my old Dad would say if he could look down on this world today.

Last summer I was in a local store and they had, "Fresh Cucumbers—15 cents a pound." Out of a bushel I was able to pick six fair cucumbers judged by our standard of 40 years ago. The balance was all culls, such as I wouldn't have believed a cucumber vine could produce. I don't remember of ever having seen a "necked" cucumber on our place or anywhere else in our neighborhood 40 years ago.

People buy and eat this trash now and pay exorbitant prices for it because they don't know any better. Poor things! They never saw any good stuff.

One buys nice looking string beans in the market. Cook them and they are woody and taste like an old rotten log smells.

So some of these days, I am going to have some "grub fitten to eat" like I used to have "when the world was young."

The last 25 years have passed so rapidly that I can hardly visualize or remember their happenings. It seems like it's only been a few days since Christmas.

Sincerely,
J. C. STEPHENS
Box 75, Tyler, Texas

—o—

COMPOST AND MULCH FOR STRAWBERRIES

In the fall of 1947 we made a large compost heap according to your ways of making it, although it was not complete. Anyway, we used about 10 tons on about 115 acres where we set our strawberries.

It was put on in early March, 1948 and worked into the soil with a

DON'T GRIN!....

WAIT UNTIL YOU READ

"Surgery with a Spade"

By A. Z. GODUNOV

Then You'll Really Have Fun

In this story the facts about transplanting are so presented that they make a delightful "COMEDY OF ERRORS"

"A well illustrated chuckling yarn—Something to read aloud at your garden club meeting." Review Flower Grower

SEND FOR YOUR COPY NOW——PRICE $1.00

JOHN J. MORRISON & SONS — Publishers

LYNCHBURG, VIRGINIA

STRAWBERRIES for *Every Need, Soil, Location, Climate*

ALL VARIETIES **Blueberries** BIG PROFIT MAKERS

Our 1950 Berry Book lists the varieties you need for highest Berry Production and profit. Each variety fully described with special information on areas to which best adapted. Nationwide Shipments.

Best Varieties: GRAPES, RASPBERRIES, BOYSENBERRIES BLACKBERRIES and ASPARAGUS

FREE 44 Page Catalog and Planting Guide
Write your name and address on a penny postcard and mail to us for your FREE copy!

RAYNER BROTHERS

SALISBURY 91, MARYLAND

Organic Gardening inaugurates its own

BOOK OF THE MONTH

See outside back cover of this issue for details on how you can *SAVE 20% ON CLOTHBOUND BOOKS!*

PROTECT your GARDEN WITH SCARE-AWAY

the modern scarecrow

PAT. PENDING

Shiny aluminum strips keep birds and pests away night and day. Protects seed as well as crops.

Package of 10 only 25c

Quick-ties

For garden shrubs, vines, flowers and vegetables

Portco Quick-ties with wire center secure your flowers with a twist of the fingers. Weatherized with resin. Round shape cushions delicate stems.

Package of 80 only 25c
Ask your dealer or order direct.
4 pkgs. 1.00 postpaid

PORTCO
CORPORATION
VANCOUVER, WASH.

Men-Women

AVOID "GARDEN" HANDS

& CALLOUSES. Also DON'T LET SOAP, HOT-WATER, GRIME, SOIL-UNDER-NAILS, PAINTING, DRY-CLEANING FLUIDS, ETC. ROB YOUR HANDS OF NATURAL OILS & COMFORT. WEAR WATSOLITE PLASTIC GLOVES.

ANNOUNCING THE 1950 SOFTEST VINYL TOUGH SEAMLESS GLOVES
DURABLE — NON-SKID
FORM-FITTING-NON-ALLERGIC
FINGER-FREE

Withstand boiling water, oil or gasoline, most chemicals, cosmetics, tire & motor grime. SOLD BY MAIL POSTPAID. Immediate Delivery! Ea. pair boxed. Sizes 6 to 10 incl. ½ sizes. Medium wt. for DISHWASHING or housework. Med. Light wt. for daintier glove in House or Garden work. $1.50 per pair postpaid. Send DRESS glove size (Do not "up" your size—we do that), & pfd. glove wt. with Check or Money Order to:

WATSOLITE COMPANY, INC.
R. D. 1, Morrisville 1, Pa.
Satisfaction Guaranteed or Money Refunded

HOW MUCH LIMESTONE?

Soiltex TELLS
WHETHER THE SOIL AND COMPOST ARE ACID OR ALKALINE---TO THE EXACT pH

Send $1.25 postpaid (no C.O.D.) for new, improved kit to test the easy accurate way in one short operation.

The Edwards Laboratory
P. O. Box 2742-S - CLEVELAND 11, OHIO

Tiller. The 19th of March we set out:

150 Fectroinca, a new kind from Kelloggs
150 Robison from Allens
150 Premier from Scarffs, Springfield, Ohio
75 Gem everbearing
75 Gemzata everbearing
75 Temple

The rows were spaced 50 inches to allow for a catch crop of green onions between the rows and to allow room for the tiller, which we used at the time to cultivate with. After the onions were gone we had a very good catch crop of green onions which were of good flavor and quality.

There were 9 rows of berries 75 to the rows, spaced 50 by 24 inches when set. They were kept clean, free from weeds, cultivated often, about 7 or 8 days all through the growing season. The rows were matted about 24 inches wide but were somewhat too thick when finished.

During the growing season in addition to the compost we used 250 lbs. of bone meal and about 150 lbs. of ground soybean meal.

In the middle of the rows we mulched with matted-together leaves to a thickness of about four inches and over the matted leaves we used 2 inches of clean wheat straw which was put on in late December.

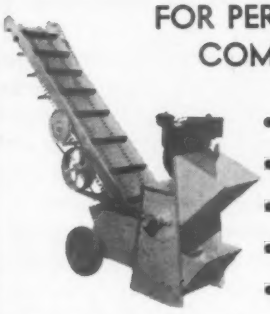
The next spring they were slow to start, that is somewhat late, but when they did it was a pretty sight to behold.

The bloom was very heavy and they all seemed to have set for we picked 1200 quarts of berries from them and the last four pickings were lost in heavy rains which rotted them.

The type of soil is a clay silt. The test on lime is 6.5 that is a little too high I believe. On other tests I find I am a little low on potash, about 6%, but we have good tests on nitrogen and phosphate and enough humus as the soil holds moisture through dry weather.

Robert E. Sroufe
Springfield, Ohio

FOR PERFECT COMPOST



- Screened
- Shredded
- Ground
- Mixed
- Piled

Rocks, trash separated. Grinds manure and tough organic matter through rolling screens, wet or dry. Screens fine as wanted through perforated screens. Free compost circular.

Dealers Wanted
In Several Open Territories

W-W GRINDER CORP. Dept. T Wichita, Kan.

TOP 15 PRIZE GLADIOLUS

You can get the 15 Varieties of Gladiolus winning most Blue Ribbons at shows in U.S. and Canada. Large bulbs to produce Champion flowers.

We have grown the top 15 winners each year for the last 3 years.

You will get a thrilling treat, a feeling of pride and happiness, to grow and show glads to your neighbors that are best in their color classes—15 beautiful colors.

The best 15 varieties are:—**Leading Lady, Spic & Span, Elizabeth The Queen, Burma, Red Charm, Spotlight, Daisy Mae, Black Opal, Margaret Beaton, Chamouny, Algonquin, Miss Wisconsin, Picardy, King Lear,** and **Silver Wings** at the leading shows in 1949.

2 large bulbs of each of the top 15 variety winners labeled—postpaid for only $3.75.

12 large bulbs of each of the top variety winners labeled—postpaid for only $20.00. You might spend hundreds of dollars and not have 15 prize winning varieties. Order at once from this ad, so you won't be too late.

PRIZEMORE GLADIOLUS GARDENS
RENSSELAER, Box 183C, INDIANA

HARDY CHRYSANTHEMUMS

by GOLDEN RULE DAHLIA FARM

You can't go wrong on any of the varieties named below. They make fine plants and bloom freely. The kind we specialize in. Your garden will be a blaze of color if you grow these mums.

Each item below is 50c.

Cliff Runyan—orange	Avalanche—white
Carnival—orange red	Symphony—pink
Eugene Wander—yellow	Courageous—red
Lavender Lady—lavender	Betty—pink
Yellow Avalanche—yellow	Winterset—white
Charles Nye—white	Huntsman—red

● Select any four and we will send you a plant of Dawn Rose (1949) free.

● Select any six and we will send you free, 2 plants of Dawn Rose and 1 Honeycomb.

● Select all 12 and we will send you free, 2 Dawn Rose, 2 Honeycomb and 2 Defiance (1949). All postpaid before planting time. Order at once. ***Send for our fine new Dahlia and Mum Book ready now.***

GOLDEN RULE DAHLIA FARM
Dayton Pike Lebanon 2, Ohio

Organic Gardening Clubs

A number of Organic Gardening Clubs have made contributions to The Soil and Health Foundation. It has occurred to us that other clubs may wish to do the same. An invitation is cordially extended to all Organic Gardening Clubs. The purposes of the foundation are dedicated to a living soil and health for all living things. Send contributions to Soil and Health Foundation, Emmaus, Pa.

New Clubs to be Organized

All persons interested in becoming a member of an Organic Gardening Club should contact the person in your vicinity, as indicated below:

Licking County
Organic Gardening Club
Dr. Clyde R. Catt,
1843 West Main St., Newark, Ohio.

Bellingham
Organic Gardening Club
Mr. Garland Haufle,
1219 Bancroft Rd.,
Bellingham, Washington.

Salem Organic Gardening Club
Andrew M. Clark,
3225 D Street, Salem, Oregon.

Oklahoma City
Organic Gardening Club
Dr. Dona Jenkins,
1215 N. W., 30,
Oklahoma City, Oklahoma.

Scranton Organic Gardening Club
Mr. F. J. Sherman,
1825 E. Elm St., Scranton 5, Pa.

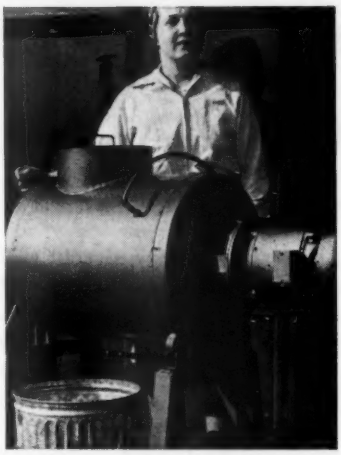
Organic Gardening Club of Jackson, Michigan
Dr. S. A. Foy,
3122 Darby Road, Jackson, Michigan

Organic Gardening Club of Cooperstown, N. Y.
N. E. Bartholomew,
Thurston Hill Road, R. D. No. 3,
Richfield Springs, N. Y.

Organic Gardening Club of Pompton Plains, N. J.
Henry R. Williams
55 Ramapo Road
Pompton Plains, N. J.

Fluid AgroMulch

IN 20 MINUTES



from

COMPOST

LEAVES

MANURES

WEEDS

yes—from

GARBAGE

Our Garden Model #18

SENSATIONALLY NEW —— EFFECTIVE

the **AGRO-MULCHER** does away with cultivating and weeding entirely as the ground remains covered around vegetables, plants, flowers, shrubbery and trees. Will arrange for a demonstration.

KURT WANDEL INDUSTRIES

DOWNINGTOWN, PENNA.

Individual Plastic Greenhouses!

Durable transparent plastic caps proven many times more effective than paper caps. Gives 2-weeks advantage when used on tomatoes, melons, strawberries, flowers, etc.... Conserves moisture, easily ventilated, easy to set, lifts for weeding. Plants always visible. Users claim that HOT-OUSE almost draw seed out of ground! Stack for storage. Size 5x8x5 in. high. Last for 5 to 7 years.

Sample Order—1 doz. $3.00 25—$6.00
50 only $11.75 — 100 - $23.00

MARTIN ROBERTS COMPANY
838-0 Symes Building, Denver, Colo.

SUPERIOR

Shrubs

from TOTTY'S

CYDONIA SPITFIRE

A striking form of Flowering Quince which achieves a brilliant effect when used for hedges. An equally excellent subject for single shrub planting where space is limited. Flowers are large and deep crimson in color produced from the ground up, on upright stems. Attains a mature height of 6 to 7 feet, but by topping once to twice a year is easily held to 4 or 5 feet.

Extremely hardy. Unharmed even by temperatures as low as 15 degrees below zero. In all respects Cydonia is just about PERFECTION in a flowering shrub. Plants are about 3 feet tall ready to bloom. ORDER NOW FOR EARLY PLANTING.

$2.50 each, $7.50 for three, $25. per dozen.

Send for the new 1950 Totty's catalog. Twenty-five cent charge may be deducted from your first order.

Totty's for the finest

Dept. O4, Madison, N. J.

THE NEW ORGANIC METHOD

[Part XII—Mr. Rodale's Cancer Series appears on page 42 of this issue.]

IT IS now four months since I suggested the new method in the handling of organic matter. Since this was a winter period there could not have been any action or experimenting with it on a broad scale. What we did was to immediately lay down an organic matter mulch in our sleeping vegetable garden and flower beds. At time of this writing it is only a month to the time of planting peas. We can hardly wait, for that will be the first opportunity to see the working of the new method. We will probably push away the partly decayed mulch, plant our peas, and as the plants grow, apply more mulching materials.

The correspondence is still coming in. Ninety-five per cent express satisfaction at the change, but here and there are hold-outs. I will not call them Tories, because it is natural for some to be more conservative than others. I, personally, am not too conservative, because in my own career I have made satisfactory progress by being quick to change, wherever that was deemed necessary. Some persons have called me impulsive. I admit I have gone by hunches on many occasions and while I sometimes make mistakes, it makes my life more interesting. At any rate the new organic method will be proven one way or the other in the current 1950 growing season so that our uncertainty will not last too long.

One of the reasons that I announced the change without waiting for at least one year of trial was that I saw many persons making plans to build expensive pits for making compost. I felt an obligation to deter them for awhile until we could try this method. I did not think it fair to encourage readers to spend that kind of money, feeling that it would be wasted.

READER REACTION

One reader writes: "It is an astonishing thing to me that you should attempt so abruptly to abolish all the teachings of Sir Albert Howard on the subject of aeration. The adequate admission of air at all times, in the making of compost as well as later in the soil itself, has always seemed to me to be an essential feature of everything he ever wrote. In *An Agricultural Testament* we read that, during the first phase of the charging of a compost heap or pile, one of the things to be 'carefully watched for and prevented' is 'the establishment of anaerobic conditions, caused generally by overwatering or by want of attention to the details of charging; it is at once indicated by smell and by the appearance of flies attempting to breed in the mass; when this occurs the pit should be turned at once'."

Let us get the facts straight. Evidently this reader believes that the new organic method is mostly the making of compost by the enclosed, Italian method. This latter process, so far, is only for the handling of manure on farms mainly. In the garden we are now working practically 100 per cent with mulches, that is, applying the ingredients that would have been placed in a compost heap, directly on the soil. There is one exception—garbage. It would not be advisable to use that as a mulch. We advise its composting by the Italian or some other similar method, if possible.

Now, let us consider this reader's criticism as it applies to mulches. In mulching, air is admitted at all times. No one has ever leveled the criticism against mulches that it created an anaerobic condition. Sir Albert Howard himself favored it in his sheet-composting method. In the case of mulches, overwatering, or heavy rains could not do the damage it would do in a compost heap. Anaerobic conditions, says this reader, would be indicated by smell and by the appearance of flies attempting to breed in the mass. One never would be confronted with such anaerobic smells, in the use of mulches, because the material is layered only one-fifth to one-tenth as high as that of a compost heap. Such smells are prevented from occurring by the thorough aeration provided by a mulch. While we are on the subject of aeration, there seems to be much evidence that it has been overemphasized. Bechamp, a French scientist who was contemporary with Pasteur, showed unmistakably in his researches that oxygen is not essential to vigorous fermentation, or at any

rate that the quantity necessary is extremely small. I believe that there is a great fallacy in the beliefs on this subject. In the Italian method, the manure is not kept in a vacuum. Some air enters but an attempt is made in this method to duplicate the air which is in a soil, called the soil air, which is rich in carbon dioxide. We made compost from manure by this method and it was of a high quality. We would refer this reader again to the December, 1949 issue of *Organic Gardening*, as I do not think it advisable to consume space in repeating arguments.

MULCHING IS THE METHOD

But to the gardener I say, you cannot go wrong by using the mulching method. For your garbage, however, make a covered pit. If you wish to pile it in a heap you will lose some of the nutriments by washing and oxidation. In Paris much of the garbage is piled in big heaps on the outskirts of the city. However many gardeners and farmers have used the material before it was thoroughly decayed. It is believed that such use in growing crops leads to intestinal parasites caused by eating food raised with such unfinished organic matter.

Professor Gustav A. L. Mehlquist in the June, 1949 issue of the *Missouri Botanical Garden Bulletin* discusses the advantages of using mulches. Let me quote:

"Organic matter has many important functions in every-day gardening. In the rough or partially decomposed state, organic matter is invaluable for mulching. Proper mulching probably is one of the most useful tricks that the present-day gardener can learn despite the multitude of new things that has become known in the last few years in the fields of plant nutrition and hormone treatments. A 6 to 12 inch layer of leaves, straw, or other undecomposed organic materials is very useful in the winter to prevent frost injury to the surface roots of tender shrubs, bulbs, and perennials. Partially decomposed materials such as leaf mold, compost, manure, peat moss, or ground corn cobs, applied 1 to 3 inches deep, are exceedingly valuable as summer mulches. This is especially true in the Middle West and South West where the rains during the growing season are often limited to the kind of showers that beat down with great force for a few minutes, carrying away much of the best top soil. The intense sun that usually follows literally bakes the exposed roots and forms such a crust on the surface that the next shower cannot penetrate the soil. However, if the soil is cultivated just deep enough to break the crust and a mulch immediately applied, the formation of a new crust is prevented, and water, whether from rain or sprinklers, is able to penetrate. Furthermore, a mulch conserves moisture by cutting down the evaporation from the soil, a very important feature in semi-arid areas. Many people still have the idea that merely breaking the hard crust of the soil will conserve moisture. Experimental evidence indicates just the opposite. To be sure, a hard crust retards water penetration but it also retards evaporation, and merely breaking it up without protecting the loosened surface soil from being washed by the next heavy rain or beaten into another hard crust is poor economy."

MULCHES INCREASE YIELDS

Here is another item from a recent issue of an agricultural journal (name not marked on clipping sent in by reader):

"Mulching cherry trees with straw or legume hay increased yields 100 per cent in experiments conducted by Dr. A. L. Kenworthy, horticulturist at Michigan State College.

"This increase occurred on trees receiving only mulch and no fertilizer as compared with trees which received complete fertilizer but no mulch. Yields increased 100 per cent. Tree size and the content of nitrogen and phosphate in the leaves increased 25 per cent over the unmulched trees. Potassium content of leaves increased 30 per cent. Sawdust, used as a mulch failed to increase the yield, tree size or nutrient content of the leaves, unless fertilizer applications were increased."

Note the increase of potassium in the leaves. Years ago I read of an experiment conducted in mulching. A mulch of material low in potassium was placed on a soil that was also low in potassium. After a lapse of about six months the soil under the mulch was tested and found to be high in potassium. The reason probably is that when the soil was first tested it was done to determine the amount of available potash it contained. The test did not indicate the amount of potash in that soil that was in an unavailable form. The juices from the mulch washed down into the soil by rain, also the decaying underpart of the mulch, washing into the soil, had the effect of mutliplying certain kinds of bacteria that made some of the insoluble potash, soluble. The mild acids of such organic matter also acted to make some of the potash soluble.

EXCESSIVE CULTIVATION

In the Dec. 16, 1949 issue of the *Los Angeles Examiner* there is an article in the agricultural section in which appears a statement made by farm adviser Kenneth Smoyer of Los Angeles County that "Excessive cultivation is doing severe damage to many citrus soils." He says that too much cultivation has created hardpans and greatly reduced soil aeration. This is a paradoxical condition. You would imagine that cultivating would increase the aeration. But it seems that by covering the soil with a mulch you create more aeration under it than by the cultivation of the soil. "Smoyer believes it possible," says the *L. A. Examiner,* "that over-enthusiastic cultivation may have had an influence on the small-sized fruit from

which the industry is suffering today." He should not overlook the effect of the use of chemical fertilizers in shriveling up the yield.

A MULCH GARDENER

I would like to reprint herewith a short article on mulching written by "Michael Differ," which appeared in the September, 1949 issue of the *Compost Magazine* of Australia. The name of the author seems to be in quotation marks which no doubt cloak an anonymous person who differs with the orthodox organic method of making compost. Here is the article:

"I am now practising a method of gardening that calls for the least amount of effort, and I recommend it to other composters as one that will take a lot of beating.

"On one patch I had a crop of lupins growing in ground that had been deeply hoed once after manuka and honeysuckle had been cleared. The other patch had not been disturbed for at least 20 years, and carried a heavy growth of weeds and rank grasses. I treated them both in the same way, and the results have been similar, although slightly better on the lupin patch.

PUSH HOE

"Here, then, is the system. Using a torpedo-shaped push hoe, skim off the growth just below the surface and drag the resulting material into rows about 3 ft. apart. Mix with it a little of any animal manure, and any other organic matter available, such as sawdust, leaves, or lawn cuttings, all of which are suitable as they are broken up and will fill the spaces between the lupin stalks. Then pull a duck-foot cultivator down the intervening spaces in order to loosen the top few inches of soil. Into this you can sow your first crop, say beans. Use the push hoe each side of the beans to control weeds and keep the surface loose. Ignore weeds that grow on the rows of mulch unless they are very big.

DUCK FOOT CULTIVATOR

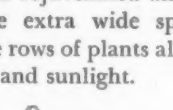
"When the bean crop is finished, run the push hoe over the whole patch and proceed as before, except that this time the mulch will be put where the beans were growing, and the next crop will go where the mulch was previously laid.

"For early potatoes, dibble the sets deep into a good, big row of mulch, where they will be much warmer than if put down into cold, wet soil, and earthing-up will be unnecessary.

"So much for the actual practice of my mulch system. Now for its main principles and advantages.

"Underneath the mulch, which is undisturbed for several months, there will be intense activity of worms, various insects, and soil bacteria. These are your workers, so treat them kindly. They move about, eat, excrete, reproduce, and die. In doing so, they break down part of the material into perfect plant food, and also loosen and improve the texture of the soil underneath all ready for the next crop.

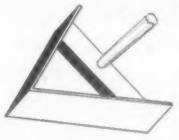
"In rainy weather the mulch prevents crusting or erosion. In dry weather it prevents evaporation, and it acts as a windbreak, particularly while the plants are small. By this method one half of your garden is rested and rejuvenated all the time, while the extra wide spacing between the rows of plants allows them more air and sunlight.



ROTARY TILLER

"Although fresh animal manure is put on the ground, it is not applied direct to the crop, but undergoes a period of maturing for several months in the mulch rows, and even then any large pieces remaining would eventually be dragged into the next mulch row.

"The soil is not inverted, as it would be by orthodox digging. (I am sure it must annoy the worms when they find plant-remains a foot below the surface when they should be on top and when they find the subsoil on top when it should be underneath!)



SPREADER

"With the use of a rotary hoe and a V-shaped spreader for pushing the mulch into rows, this method could probably be adapted to field cultivation. In the garden, at any rate, it means much less hard work, and that is always an attractive prospect!

"By the way, that push hoe must be kept polished clean and sharp. Put a rounded knob, or short crosspiece, on the end of the handle. Its drag then makes it much better for the purpose than a rake: it doesn't take so much small stuff with it, and it doesn't clog."

GARBAGE

Here is a method that Paul Dawley of Antiago, Wisconsin, suggests for handling garbage:

"It will be easy to remove the ends from a steel drum, put several inches of hay or other dry matter in the bottom, pile in the garbage or what-have-you, cover each batch with some earth, the barrel itself with a lid, and leave alone. The open bottom will attract earthworms of which, without intentional cultivation, I have large numbers, and the garbage and fertilizer problems will be solved."

My suggestion would be not to knock out the bottom of the drum, but to fill it with eight or ten inches of topsoil so that the water leachings from the garbage will go into it. Then this bottom soil can be distributed in the garden. Another variation would be to dig this drum into the ground so that only six or

seven inches protrudes at the top. I would keep the top of the lid on the drum so as not to permit air to enter. It would make better compost if earthworms were used, also some ActivO or BCA, bacteria activator.

COMPOST BINS WITH CONCRETE BOTTOMS BEST

It is interesting to notice how horticulturists change their minds so often. But it is much better to be progressive in our thinking than it is to stick stubbornly to an antiquated idea that has proven itself unsound.

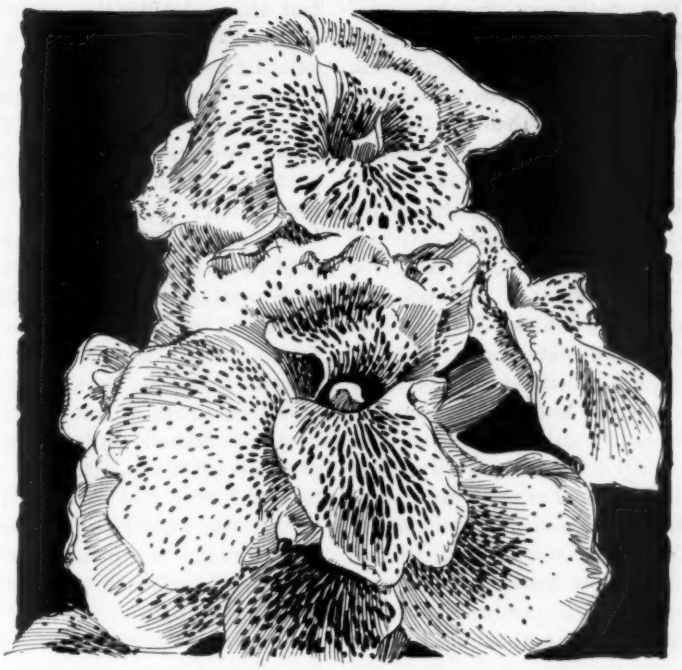
Take, for instance, the matter of making compost. A number of years ago when we first made our compost pit, we had read that it should have a concrete base so that valuable elements in the compost could not leach away. But in the process of building we got lazy, and the result was that only one side of the pit got a concrete base.

Open Bottom

Then later we read that compost bins should be open on the bottom so that valuable soil bacteria would be free to enter the compost and help break it down sooner. So we were glad that we had one side of the bin open. But, frankly, it worried us sometimes to think that valuable material must be leaching away into ground where it could do no good.

So we figured it was time to do a little experimenting and observing on our own. The bin is worked so that as one side is being filled with material from the kitchen and garden, the other side is decomposing and getting ready for use. Recently the side with the concrete base was ready for use and we decided to use it on the lawn. As we got down near the bottom the material was much darker in color. It was very moist and a little unpleasant to handle, like soft mud. But we've noticed since that those spots on the lawn that received that compost greened up much sooner than the rest of the lawn, so we are convinced that the concrete base is the best.

J. I. RODALE.



Let's Bring the Canna Back

by CHARLES V. APPLEGATE

BACK in the days when cannas had very small flowers, they were grown by the hundreds. The leaves were really more showy than the flowers. Today, modern cannas with huge, bright flowers in red, yellow, orange, pink, white, and combinations of these colors, are grown by very few gardeners. Why have they lost their popularity when the new ones are much more showy?

Perhaps the greatest cause was that they were over-used. City parks had large beds of them, they were planted around the base of the great bronze reindeer, large beds accented large lawns of estates, and some gardeners used them as a border along the vegetable garden. The canna was seen too much.

Occasionally today we see them used in beds, but there are many new uses for them. In the flower border they can be used in groups of several roots for a bright splash of color from mid-summer until frost. Cannas may be used as a bright background in a flower bed along a wall, or in the center of a bed in the lawn with annuals planted around them. They even look nice in rows in the garden with dahlias for cutting. In fact cannas are good anywhere you want color. Their tall, torch-like beauty can set off other flowers to a good advantage.

Cannas can be purchased in 2 or 3 eye divisions from most bulb dealers. The roots should be planted as soon as the soil has thoroughly warmed up in the spring. Set them about 2 inches deep and 12 to 24 inches apart. A good shovelful of compost should be mixed in the soil around each root. If you want ear-

lier flowers, the roots may be started in 4 inch pots, inside, early in April. Use good soil with some compost mixed in. After warm weather comes, transplant them to the garden. Cannas need as much sunlight as they can get. They do not bloom in shade. They may be shaded for a short time, but should have sun at least half of the day. Also, the soil must be moist at all times, and should not be allowed to become very dry. By mid-summer they will make good growth and will be ready for another feeding of compost. With correct culture, each root division will have grown into a large clump by fall. Let them grow until the leaves are frosted. On the morning you find them frosted, cut off the stalks just above the soil line. Cut them off *before* the sun shines on them and turns them black. This improves the keeping quality of the roots. Lift each clump carefully and let some soil adhere to it. One of the best methods of storing is to put the clumps with soil adhering in boxes and cover with dry sand. Cannas should not have a very low temperature in storage or they will rot. If it is too high they will dry. A temperature of about 60° is best. The roots should be examined several times during the winter and spoiled ones removed, or the temperature changed if necessary. When planting time comes again, remove all dirt from the roots and divide them into sections with 2 or 3 points, or "eyes". Each of these will grow into a stalk.

The new light colored cannas are difficult to keep successfully. If you have trouble keeping them, here is a method which may be helpful. Cover the cannas when frost is expected. After a frost, when the others are lifted, lift these that have not been frosted with a large ball of earth on them. Cut the stems back half way, and pack the plants in boxes or buckets with moist soil around them. Set them in the basement near the window so they can get as much light as possible. Keep the soil just moist enough through the winter to keep the leaves green. They should be rather cool so they will not make too much growth. A temperature about the same as for completely dormant roots is correct. In the spring these plants can be divided and started in pots or in the open ground in the usual way.

The new cannas have either green or bronze leaves. The use of cannas should help to decide the color of the leaves. Here are some of the best ones.

BRONZE FOLIAGE

Wyoming—6 feet—orange-yellow
King Humbert—5 feet—orange-scarlet
Shenandoah—4 feet—rose-pink
Ambassador—5 feet—scarlet

GREEN FOLIAGE

City of Portland—3½ feet—pink
Eureka—4 feet—white
Hungaria—4 feet—satiny rose-pink
Mme. Crozy—3½ feet—scarlet bordered yellow
Mrs. A. F. Conrad—4 feet—salmon-pink
Richard Wallace—4½ feet—canary yellow
The President—5 feet—cardinal scarlet
Yellow King Humbert—5 feet—yellow, crimson dots
King Midas—4 feet—golden-yellow
California—4 feet—orange-yellow
Fiery Cross—5 feet—crimson-scarlet
Copper Giant—4 feet—old rose, suffused copper

Canna roots are inexpensive and the pleasure from them is great. They live from year to year and most of them will multiply rather rapidly. Try some of the new ones and you will have a colorful surprise.

Miscellany . . . .

DELUGE OF ATTACKS

RECENTLY there has been a deluge of attacks against the organic method in the newspapers and in publications generally. This is a good sign because it shows that our work is getting around and being felt. The opposition is highly concerned about the "damage" that we are doing. Therefore it was with surprise that I read the following item in the new book recently published by the University of Oklahoma Press called *The Business of Farming*, written by Degraff and Haystead:

"The theory (organic) has not been adapted to commercial agriculture on a wide scale, although very recently a book entitled *Pay Dirt* has attracted much attention and may bring in its wake wide experimentation and possibly an eventual significant acceptance."

Mr. Haystead is the agriculture editor of *Fortune Magazine* and has an accepted standing in this field. His words are hearteningly encouraging.

ILLINOIS

We look with admiration to the agriculture of the State of Illinois and to the Agricultural university which directs it. Here is one state that uses practically no superphosphate, the highly concentrated chemical form of phosphate. Instead it uses the ground, raw phosphate rock which we highly recommend. In 1948 it used more than fifteen times the amount of the rock than it did of the super. In the January, 1950 issue of the Illinois Alumni News there is a fine article entitled ***Univ. of Illinois Program of Soils Vital to Life of State*** which shows that this university is acting more in the interest of the farmers than the manufacturers of the concentrated chemical fertilizers. That is more than the average agricultural university can boast. Here is a significant statement from the article:

"The University always has urged

the use of straight materials for the soils instead of mixed fertilizers which are urged by commercial companies. Ever since the time of Hopkins, the scientists have had a tough time with this idea because of the pressure of the commercial organizations; but the Illinois idea has spread to other states and one Illinois agronomist said the other day, 'We're winning'."

SHERWIN-WILLIAMS DROPS POISON SPRAYS

Sherwin-Williams, the large paint concern and a prominent manufacturer of poison sprays and agricultural chemicals has recently decided to get out of this business. The notice in *Chemical Engineering Magazine* says that at least two other major producers of DDT are likely to follow suit and get out of the insecticide business. It said that "The move came as a surprise, since the company had been highly successful in the agricultural chemicals field, in which it had spent heavily for research....At Cleveland, Sherwin-Williams had recently completed a $275,000 agricultural chemical research building. What prompted Sherwin-Williams to pull out of agricultural chemicals?....Legal actions may have been a last straw forcing the decision. There had been a series of suits for contributory liability in damage incident to alleged improper use of weed killers. Total claims filed against the company are said to have come to about $1 million. And an Arkansas state supreme court decision,....made the company think twice about the legal risks in the pesticide business. The Arkansas court held that any manufacturer failing to label containers with full and explicit directions and warnings about the risks in using his products is liable for damages caused by chance application (by airplane, for example) of chemicals on fields for which they were not intended."

This is the manufacturer's angle. From the orchardists' side comes the complaint that so much poison spraying is required today that it is becoming an uneconomical proposition. Many orchardists are going out of business. They cannot make money at it. The public soon will have to become accustomed to buying fruit that has a little nick made in it here and there by an insect. Today some apple growers spend $100 an acre to control insects.

Hearings are now being held in Washington by the Food and Drug administration to determine whether poison sprays are harmful to consumers. These hearings may last for a year and I will have an opportunity to appear there soon and to give the organic side of the case. Dr. Bennet A. Porter of the Bureau of Entomology of the U. S. Department of Agriculture at one of these hearings said that growers would go out of business if they did not use chemicals. It is not typically American

to throw up one's hands. At least the Department of Agriculture should experiment with the organic method in orcharding to see if the use of plenty of organic matter in the soil will make the trees healthier, and thus resist insects. The constant saturating of the soils with poisons, kills bacteria and fungi and interferes with the natural process of the tree's feeding. It sets up artificial conditions that might bring on more insects. It is nature's way of wishing to destroy something which is not healthy. Even professional entomologists know that insects come where there are deficiencies.

INSECTS KILLED BY SHORT WAVES

There is a new radionic warfare on insects which is being tried out in Texas. One newspaper says, "The gentleman farmer of the future may sit in the parlor and twist a few dials to kill every bad bug in his citrus grove two miles away." I am afraid of these methods that may kill the good bugs with the bad. I know several citrus growers who are controlling insects by placing a lot of humus in the soils of their groves.

SOMETHING WRONG WITH MEAT

Here is a clipping that appeared in the *N. Y. Herald Tribune* of Jan. 29, 1950 that shows more trouble is developing in our artificial agriculture:

"Fat juicy steaks aren't what they used to be, nutritionally speaking, the International Harvester Company has decided, placing ultimate blame on the lack of tiny quantities of minerals in the soil which are not supplied by fertilizers. It has financed an investigation by the Armour Research Foundation at the Illinois Institute of Technology, Chicago, to find whether this is true. To date, Dr. Arthur J. Mittledorf has ascertained that deficiencies in cobalt, molybdenum, manganese, zinc, copper and iodine in the soil are causing plants to be deficient in these elements, and that animals fed these plants suffer similar deficiencies with resulting nutritional disorders."

PROTEIN

It has been discovered recently that the protein content of grains is going down alarmingly. In the Middle West in the last ten years it has been reduced about 10 per cent. Dr. Tom S. Hamilton, of the University of Illinois is concerned about it. He discovered that where plant breeders developed corn varieties that would give higher yields of protein, merely because of the character of the seed, such increase made a decrease in the quality of the protein. This was proven in feeding tests on white rats. The way to get protein of the best quality is to pile in more organic matter in the soil. Organic matter is intimately interrelated with the release of ni-

trogen in the soil, and nitrogen is an important ingredient of protein.

ORGANIC FOODS TASTE BETTER

Here is a letter that was published a few weeks ago in the *Boston Herald*:

WHY TASTELESS CELERY

To the Editor of The Herald:

Just as long as chemical fertilizers are used exclusively in the production of our vegetables, they will not only be tasteless, but they will be devoid of the life and health giving vitamins the body needs. Monetary gain is at the bottom of it, and only public demand for organically grown vegetables will rectify this condition. Nature's method of replenishing the soil with manure, clover crops, etc., is best. When we abuse Nature, we pay for it. As it stands now: quality is being sacrificed for quantity.

Margaret I. Jardine
Shirley Center.

CHEMICALS REDUCE YIELDS

Here is an item of unusual significance which appeared in the column entitled "For the Farmer" in the *Detroit News* of Jan. 17, 1950. The author is John Merrifield, a nice-sounding agricultural name:

"At the University of Illinois, where the famous Morrow Plots experiment has been going on since 1876, lands on which corn has been grown continuously have produced less than 15 bushels per acre when treated with chemicals only.

"Plots treated with stable manure, ground limestone and rock phosphate have grown 61 bushels an acre.

"And identical soils treated with the same minerals and manures, plus plowed-under clover crops each three years, averaged 97 bushels.

"Experts agree the extra yields come through the action of bacteria which thrive in soils well supplied with organic matter. It is also a theory that foods grown on such soils are more nutritious.

"The extra equity obtained through soil building is one which enriches everyone."

Merrifield says further:

"Dr. Turk suggests farmers should produce the needed organic matter on the farm, and use the materials to the benefit of their soils. Barnyard manure, crop residues and green manures cost little when produced at home.

"Crop residues, for the most part, consist of roots and stubble of crops grown for profit. Green manures are crops planted solely to be turned under.

"The value of the materials has been fully shown experimentally and in actual field practice. It has, for instance, been shown that if efforts are made to get crop residues, supplemented with green manure and stable manure, back into the soil tilth is easily maintained.

"Farmers have discovered that treating soils with chemical fertilizers alone will not result in top production. And scientific studies have emphasized the discovery."

FISH HEADS IN COMPOST

Dean Acheson, Secretary of State, is a maker of compost. In the *New York Times Magazine* of Jan. 22, 1950 in an article about him, the author brought out the fact that there is a continued, good-natured feud between Acheson and General Marshall in which the former holds that it is necessary to use fish heads in a really good compost pile. Here is a typical quote from the article:

"General Marshall used the Army Chief of Staff system at the State Department and while you could never get Acheson to concede that Marshall ever made a mistake in his life (other than in keeping fish heads out of compost piles), the Marshall system really didn't work very well. He expected the staff to bring policy to the point where he could say "Yes" or "No." If the staff agreed on something, he accepted their decision usually without question."

Now here is a baffling problem of state. How can fish heads be used in the new organic method?

NOT ENOUGH DOCTORS

Time magazine says that the reason there is a doctor shortage is that the doctors themselves keep their profession too exclusive. "In 1905 and in 1949, the number of medical students in the United States was almost the same—though the population had all but doubled." (Jan. 23, 1950). Now the Government is going to give financial aid for students to assure a greater supply of doctors. This is false reasoning. If the Government would use this money to spread the organic method in agriculture; if it would use this money to salvage every bit of organic matter that is now going to waste and see to it that it goes onto the farms; if it would see to it that the potato surpluses are plowed back into the soil rather than destroyed, we would have less disease and need less doctors than we even now have, insufficient as that might be.

BUYING DAY-OLD CHICKS

I had to make an important decision the other day in the placing of our annual order for day-old chicks. For a certain price we could get the regular run of chicks. For a higher price we could procure chicks born of chickens who had high laying records. I purchased the cheaper grade because I believe the meat and eggs of such chickens are healthier. To lay more eggs involves more of a strain on the glands and organs of a chicken and I am sure it takes its toll. If my chickens could be made to understand English I would tell them to take it easy and lay a minimum of eggs. What we want is health of man and animal.

(*Continued on page* 53)

Wild Flowers

in the Home Garden

by M. B. CUMMINGS

University of Vermont

Homemade Shade House

1. Evening Primrose
2. Bloodroot
3. Virginia Cowslip
4. A Mustard

MANY wild flower plants secured for many years from the wild can now be bought or grown in the home garden. This is a new idea to many people, yet it is an established practice, and will put to ease those people who have a fear that choice wildlings may become extinct, due to a careless and indifferent attitude of collectors.

The thought that a stiff law forbidding the collection of rare plants, a statute with "teeth in it," is needed and the enactment enforced so that violators may be apprehended and penalized to the end that species in limited supply may be protected and preserved for posterity, seems unnecessary now.

Willful destruction and waste of either wild or cultivated plants should always be discouraged and condemned. But species of no real beauty and of no utility need not be protected or even propagated. Such plants can be neglected and forgotten. Mere rarity is no excuse for protection. Uncommon plants or mere oddities are unimportant. But scant occurrence of choice plants is a matter of deep concern to all lovers of plants, and to others also. Rock gardens offer a place for the unique and picturesque.

Many nurserymen and plant collectors have made a study of wild flower habitats and can duplicate them; they can propagate the wild plants in quantity for public needs, thus dispensing with long hunts and tiring trips for wildlings. Rapid multiplication of scarce plants may soon forestall the need for statutory protection. Even now legal measures are seldom involved, as there is little need of it.

(*Continued on page* 54)

Primroses

Building a Hardy Border

By JULIE BEDIER

WHEN our house was built the contractors dumped a few loads of clay in the yard, on top of a fill-in of broken bricks and trash. There beside a south wall was a place that called for a flower border. It was lower than the adjoining lawn. All during the winter thaws and summer rains, water six inches deep stood on the clay soil. The place was so sour and soggy that even weeds avoided it. That was my garden.

Every day for several years, I made a trip or two into the woods with wheel-barrow or basket and came back with a load of leaf mould, which I dumped into my garden. Inch by inch, foot by foot, the garden bed rose up out of its depression, and the soil took on a spongy blackness. Water no longer stood on top of it. I used some manure and bone meal to enrich the soil, but it was the humus that made the big difference. As the soil was built up, I planted my hardy perennials in place.

Who knows how a hardy border will turn out? I studied ready-made plans, and some of the hints were helpful. Flowers, however, do not always come out as the plans say. A clump of phlox grows too tall, and hides the Floribunda rose behind it; a day lily grows too big, and ruins the iris near it. Colors do not always harmonize. Besides, I was not able to buy all the special varieties which the plans called for. I raised some plants from seeds, propagated others from stray clumps we had around the place, and bought a few bulbs and roots. I planted them in the border with as much forethought as possible. That was all.

Whenever I noticed a thriving clump of something or other battling with its neighbors, either in color discord or for "Lebensraum," I simply dug up one or the other offender, just as it was, in full bloom. I dug it up carefully with plenty of soil and dunked its roots in a bucket of transplanting solu-

Tulips and other Perennials

An Iris Border

tion. Then I put it where it had room and looked best. When I had it set in place I dumped the bucket of transplanting fluid into the hole before I filled in the soil. I shaded the plant with an upturned bushel basket for a few days, unless I happened to guess right about the weather. (It is the wise and lucky gardener who gets things transplanted at the beginning of a week of rain.) Phlox, hemerocallis, iris, chrysanthemums, any number of plants took this treatment without a murmur, and the next year I had the satisfaction of seeing the right flowers bloom at the right times, in the right place.

I would never have done this to roses on purpose, but one June, when the Queens were in full bloom, some grading was being done that would have destroyed a dozen pink Floribundas. I dug them up, soaked them in the solution, and planted them in my border near some regal lilies. In this case I took the precaution of cutting the bushes back five or six inches and kept them watered well and shaded until we had a long rain. No one was more astonished than I when they bloomed through the late summer and fall.

Of course I do not try this summer transplanting on peonies or Oriental poppies. August is the time for poppies, October for peonies. They are temperamental about being transplanted even then, and will sulk for a season or two afterwards. Plants with long tap roots are generally that way.

When plants outgrow their space, I divide them in fall or spring and have plenty to give

(*Continued on page* 55)

Dry wall terrace around Perennial bed

All-America Selection 1950

THE BEST NEW VARIETIES OF FLOWERS AND VEGETABLES

By RAY W. HASTINGS, Secretary
ALL-AMERICA SELECTIONS

Fire Chief Petunia Wins All-America Selection Gold Medal

FIRE Chief Petunia, actually spectrum red and with the glow of scarlet, is the only flower to achieve All-America Selection honors for 1950. It merits the first Gold Medal award for flowers, since 1938 brought forth the first red Morning Glory, named Scarlett O'Hara.

Home gardeners, as well as seedsmen and greenhouse growers, have wanted for years a real red petunia, rich and vivid in color. Plant breeders have crossed, selected, selfed, backcrossed and otherwise worked with this most popular of all annual flowers to create a red. And, here it is, with velvet depth and brilliant warmth.

Fire Chief grows just about twelve inches tall and wide, covering itself with large, plain-petaled flowers from early spring until killing frosts in late fall. In the lower South or indoors it lives on through the winter. Petunias are, after all, tender perennials although treated and grown as hardy annuals over most of America and Canada.

Hybrida nana compacta, or dwarf compact hybrid, is the type to which it belongs. The compact plant holds its uniform bushy shape well through the season instead of dividing its center and sprawling over the ground. Fire Chief thus is ideal for bedding, low borders, edging gardens and walks or drives. For potting and window or porch boxes, the everblooming, glowing mass of red is striking against a white or light-colored house or background. Its use gives life to stone and brick, complements masses of green.

The flower arranger makes fascinating use of Fire Chief in most any shape container. The graceful, willowy stems work into all shapes of display and this is one flower which can be used effectively in crystal bowls and vases because of graceful stems showing through the glass.

Easy to grow by anyone, seeds may be sown early in a pot, saucer or flat box placed in a sunny window, to transplant as soon as trees start unfolding their leaves in spring. A hot bed, cold frame or greenhouse, of course, may be used to start the seed. After the soil warms up in spring, the seeds may be started in open ground, merely sprinkling the tiny seeds on finely worked soil and pressing them in the smooth surface. They may be barely covered with sifted soil to hold the seeds in place. Growth starts within ten days and after the plants develop their second pair of leaves they may be transplanted to desired locations or thinned out, to prevent crowding, and left to bloom where they stand.

Hundreds of seeds are put in each packet by the seedsman so with ordinary care the smallest packet

CONGO WATERMELON

FIRE CHIEF PETUNIA

should produce many plants to grow and bloom all summer long. Unlike the double, ruffled and other types of petunias needing expensive hand-pollinization to produce a few seeds, Fire Chief is packed with power, open-pollinated, extremely free-flowering and well worthy of the highest award and recommendation that a new flower can win.

Bred and raised in southern California sunshine, this outstanding new variety holds its thrilling color. Beds retain their fresh appearance without fading or discoloration. Seeing Fire Chief in the All-American flower trial grounds over the country, in sand to clay soils and from near sea-level to mile high locations, north and south, ocean to ocean, many visitors have exclaimed about this as the finest of all petunias. Gardeners everywhere certainly will want it in their gardens and for their flower shows and cut-flower arrangements this first year of introduction.

There are enough seeds to furnish a dozen to every man, woman and child in America this first year. Many seedsmen are furnishing it and all have or can get it for you. It's the top flower of the year and should be obtainable through your favorite source of seed supply. That's Fire Chief, the first true red Petunia.

Congo Watermelon Wins A.A.S.

Congo Watermelon wins regional

UCONN SQUASH

TOPCROP SNAPBEANS

recommendation of All-America Selections, with a temporary Bronze Medal award which may rate even higher after completing its two-year tests. Because of its wide distribution to seedsmen for increase and the desire for earliest possible distribution to melon growers, Congo is released for 1950 introduction.

Here is a very firm-meated melon principally sugar in its maximum twelve percent solids content, of exceptional quality and fine grain texture for a tough rind melon especially for marketing and shipping. Congo is likewise suited to home garden use, valuable for its long keeping qualities on the vine or in storage.

Maturing in ninety days in the melon producing sections of the south, where it is particularly recommended and reaches a size up to sixty pounds in weight, in Massachusetts it ripened earlier than any of the standard shipping varieties. Wide acceptance is assured with its more dependable eating qualities than those of Cannonball, Tom Watson, Dixie Queen, Dude Creek and the like.

Congo resembles the Garrison (Darlington, Coker) melon in approximate shape, size and quality. It is a striped melon but much darker green than Garrison and with a tougher rind. Seeds are slightly smaller, light tan in color with darker tan side patterns. It has less anthracnose, less gourdneck, less hail damage and less breakage in handling and shipment. It has less anthracnose and better quality than Cannonball. Congo is not immune to disease but has shown an important degree of resistance to anthracnose. It is not resistant to downy mildew or fusarium wilt, and growers are urged to give Congo the same protection against disease as they would give to other varieties.

Several plant breeders have cooperated in the creation of Congo. The original anthracnose resistant ancestor was sent by the Rev. Rush F. Wagner from the Old Umtali Mission in Africa. It was crossed with Iowa Belle at the Iowa Experiment Station. A selection from this cross was inbred for several generations at the Watermelon and Grape Investigations Laboratory of the University of Florida at Leesburg, Florida. This result was crossed with Garrison at the Regional Vegetable Breeding Laboratory of the U.S.D.A. at Charleston, S. C., where inbreeding for several generations produced this important new Congo Watermelon. It was entered in the All-America trials by C. F. Andrus, Horticulturist of the Charleston Station.

All-America Selections recommend it, according to findings above, for regions where standard varieties of watermelons are successfully grown. It is especially commended for its shipping qualities, together with its good eating and long-lasting qualities.

There are twenty All-America vegetable trial grounds over the United States and southern Canada, where outstanding vegetable specialists grow and compare the many new variety prospects from around the world with the best similar varieties already in commerce. Distinctly different and superior new creations are awarded, according to their merit and usefulness, and recommended to the gardeners and planters of North America.

Uconn Squash, the new bush type of Acorn or Table Queen for both summer and winter squash use, and Topcrop Bush Snapbean, for the highest quality and heaviest producing bush snapbean to date, win Gold Medal awards and general recommendation as All-America Selections for 1950 introduction. They are available from most seedsmen this first season. Congo Watermelon is recommended for watermelon growing regions.

New Squash and Bean Win All-America Selections

Uconn Squash and Topcrop Snapbean win the highest possible awards, Gold Medals, that a new variety can achieve. Thoroughly tested in twenty All-America vegetable trial grounds over the United States and southern Canada during the past two years, these are the only new vegetables to merit All-America award and recommendation. They are 1950 introductions, available to

gardeners and planters this season for the first time.

Only one other vegetable has merited Gold Medal distinction, Caserta Squash in 1949, since three varieties won that distinction fifteen years ago. They were Giant Southern Curled, Long Standing, Mustard; Scarlet Dawn, for an early Tomato; and Straight Eight Cucumber. These three are still leading varieties of their kinds today.

Uconn Squash is a true form of the Acorn or Table Queen type. It was developed from a cross between Acorn and the 1938 Silver Medal winner, Yellow Prolific Straightneck, by Dr. L. C. Curtis while with the University of Connecticut Experiment Station. Uconn has the general shape and dark green skin color of Acorn, popular size and shape for baking and stuffing, together with its delicious, buttery, yellow meaty flesh. It also has the extreme earliness to begin fruiting and compact bush form of the Yellow Prolific Straightneck variety.

Uconn is very prolific, seeming to pile one fruit on top of another over a long bearing season. Instead of sending out long runners on vines, like Acorn, which take too much space for most home gardens and prevent cultivation, Uconn may be planted in rows or hills, occupying only three feet of space each way. It can be cultivated by hand or wheel hoe or tractor to keep down weeds and to provide a dust mulch against drought. It is a dual purpose variety, with no loss or waste of fruit. It may be picked when young and tender, boiled and otherwise prepared for eating as a summer squash. And fruits may be left on the bush to mature for storing and using as a winter squash.

This popular Acorn squash type is a market favorite in many sections of the country and commercial growers will be quick to capitalize on the space conservation, heavier yields per acre, much earlier maturity and ease of cultivation with Uconn.

Topcrop snapbean is the other Gold Medal winner and only other vegetable introduction recommended this year. Because of the wide-spread use of snapbeans over the country, for using as fresh green beans right from the garden, for canning and freezing, also for shelled beans, a big variety improvement is of tremendous economical importance. So it is with Topcrop, created by Dr. W. J. Zaumeyer of the U.S.D.A. Bureau of Plant Industry, Beltsville, Maryland.

Tendergreen snapbean won a Gold Medal in 1933. Its outstanding quality quickly made it the most widely planted variety in America, with some forty percent of all snapbeans produced. Keystonian, Longreen and Supergreen were improved selections cut of Tendergreen, for longer pods and therefore somewhat heavier yields. They are good varieties but most all snapbeans were losing in yields because of diseases, especially in the big commercial bean-producing areas.

Dr. Zaumeyer started working for disease resistance in such a top-quality bean. Recently he produced Rival, quite good and disease-resistant, but his crowning achievement is with the new Topcrop. It is of highest Tendergreen quality, early maturing, round and very meaty, stringless and fiberless. In three years' comparisons with other varieties in leading bean-producing sections it has yielded about one-third more than the heavy bearers and nearly doubled the yield of Tendergreen. This is largely due to disease-resistance in Topcrop.

It reaches eating stage quickly and is economical and easy to pick. The crop is concentrated, so can be harvested in two or three heavy pickings, instead of producing a few pods at a time over a longer season. This allows smaller plantings and more repeat plantings during the same seasan, or allows clearing the land for other vegetables. This is very important to commercial planters and may well be considered by the home gardener.

Topcrop snapbean is immune to common bean mosaic and to greasy-pod or shiny-pod, serious bean diseases affecting the growth of the plants and production of edible pods.

Topcrop is well adapted to canning and freezing. The pods stay in edible condition over a long period, even after they get "bumpy" with the enlargement of the seed in their slow maturity. It is the new garden bush-bean to plant and to eat.

Seventeen of the country's leading bean seed growers have cooperated in producing seeds from Dr. Zaumeyer's original stock seed and all seedsmen have had ample opportunity to obtain these seeds for cooperative distribution this season. There are far more seeds of Topcrop available than of any other known variety for introduction, but we'd suggest early orders from your favorite seedsmen just the same. There's never enough to supply first year demand of an All-America Selection.

SOIL AND HEALTH FOUNDATION—Leucosis Experiment With Poultry

The SOIL AND HEALTH FOUNDATION has just started a feeding experiment with 50 day-old chicks furnished by one of the largest breeders of chickens in the United States. These chicks come from a strain that are extremely susceptible to the disease, leucosis, which is ravaging many commercial poultry flocks today. It is safe to say that about 20% of chickens in many flocks today are afflicted with leucosis which enlarges their liver and causes them to stop laying.

The idea of the experiment, which is being conducted by the SOIL AND HEALTH FOUNDATION, is to feed them food raised organically to see if it can curb the strain of leucosis in these chicks. The answer will be available by the end of the summer.

To become a member it is necessary to make a contribution. No amount is either too large or too small. I hope also that existing members will now send in their contributions for 1950. Please send the money to J. I. Rodale, SOIL AND HEALTH FOUNDATION, Emmaus, Pennsylvania.

BUILDING RESISTANCE TO DISEASE AND PESTS

Herbert Clarence White, Organiculturist, inspects one of his Red Delicious apple trees two months before harvest. The Biological Research Farms are seeking, through a program of soil enrichment, to demonstrate that healthy trees will resist all disease and insect pests, including the destructive coddling moth.

THE 4 FREEDOMS on the Farm

by HERBERT CLARENCE WHITE

Director, Biological Research Farms
Paradise, Calif.

LAST week it was my happy privilege to accept an invitation to teach the combined agricultural classes of La Sierra College for the entire school week, December 12-16. This was the first opportunity of its kind for me, and it proved a real thrill to meet these fine young men of College level, and to discuss with them the many-sided problems of present-day Agriculture.

For the class in "Agricultural Economics", Professor D. Cecil Barr requested one morning that I present the topic: "Can Rural Living Be Made a Financial Success?" Roger Babson, internationally-known Statistician and Consultant in the realms of finance, has been telling the American people for years that the *only* real "hedge" against hunger and want when inflation strikes, is a modest home in the country, surrounded by a little subsistence farm. He says we must avoid the cities as we would "small-pox" centers.

The big $64.00 question is: Will it work? Can city-dwellers who turn their backs on the "madding throng" to seek a quiet spot in the wilderness survive? In response to Professor Barr's request, I endeavored to present to the young men in this class some of the factors, without which life on the farm from the standpoint of "economics" might prove hazardous, or even downright disastrous. Among the many problems that stare modern agriculture in the face, there are four, which to my way of thinking, stand out prominently. They are as follows:

1. *Freedom From Erosion, or Loss of Soil Fertility.*

None of us will fail to agree that Agriculture's precious possession is its living, fertile topsoil. If we are to enjoy any degree of economic security on a small subsistence farm, we must above every other consideration keep this topsoil where it belongs. We cannot, under any circumstances, afford to let this synonym for "fertility" slip down into gullies, into muddy rivers, and from thence into the sea. But that is the sad story of 200 years of American farming. Even back in Colonial times neglect, together with faulty agricultural

COMPOST HUMUS
IN THE MAKING

Of paramount importance in the soil-building program at the Biological Research Farms, is the liberal quantity of high-grade compost humus that is made each year to supplement the alfalfa and leaf mulches. The heap on the left is thirty feet in length, nine feet wide, and five feet high. Each heap will net about nine tons of finished compost.

practices had resulted in tremendous losses from erosion. Patrick Henry once declared: "He is the greatest patriot who stops the most gullies!" What happens to the American raindrop, according to some scientists, is of vastly greater importance to the lives and health of our human population than any potential disaster that might descend upon us from the explosion of the atom bomb.

Ten years ago the U. S. Department of Agriculture made a survey of all the cultivated soils in the United States, and our experts found that no less than 253,000,000 acres, or 61% of the total area under crops, had been completely or partially destroyed. In fact our bad farming practices in the last fifty years destroyed more land faster than in the whole previous history of man-kind.

On this point of soil conservation —or rather, LACK of it—Fairfield Osborn, president of the New York Zoological Society, sums up our predicament in these scathing words: "The blind destructiveness of man seems beyond belief! Man has become definitely more destructive than any of the elements. With increasing technical efficiency he commits racial suicide with increasing rapidity."

I have a neighbor in Paradise who left the city two years ago and purchased a small 20-acre fruit farm. He paid a high price for this land—only to find, after a second look, that nearly all of his precious topsoil had been washed down onto his neighbor's farm below. What he has left will scarcely grow healthy weeds! That man is headed for trouble. And his is not an isolated case.

Fifty years ago one prominent American writer declared: "There is need of intelligent and educated ability to devise the best methods in farming, that the worker may not labor in vain. We should so train the youth that they will love to work upon the land, and delight in improving it. The earth is to be made to give forth its strength. She has blessings hidden in her depths for all those who have courage and will and perseverance to gather her treasures."

In Biological Soil Building, we believe we have the "key" which will unlock the "treasures" in the soil. By the simple process of building up the humus content of the soil, thus providing food and housing for the beneficial bacteria, fungi, and earthworms, the crumb structure of the soil is preserved, its ability to withstand erosion in case of heavy rainfall is improved, its permeability, and its power to absorb and retain moisture is maintained, and EROSION—with its resultant loss of soil fertility is checked.

If space would permit, we could cite experiences of Organic farmers from ocean to ocean, and from the northern boundaries of Michigan, right down into the regions of the "deep south", where today, as a result of these soil-conservation prac-

tices, there is not a drop of run-off on rolling or even hilly farmlands.

2. *Freedom From Disease.*

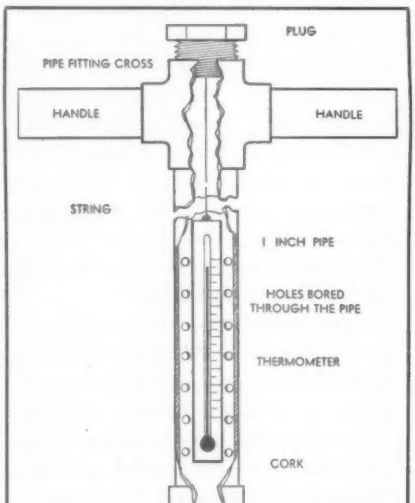
"Life is far too complex to be remade by chemists," declares Fairfield Osborn. "The *HEALTH of plants* depends on the *living* network of bacteria, fungi, worms underground, and the proper balance of birds, and animals and insects above ground." According to this man of science, the LIFE in the soil, NOT the chemical constituents of the good earth—is responsible for plant health. And if we have healthy plants we have disease-resistant plants, and if we have disease-resistant plants, we have that boon of all boons in Agriculture —freedom from disease.

Jean DeBru, prominent French scientist, went so far as to assert that optimal fertility can be restored to depleted, worn-out soil without the use of any fertilizer—providing the land is cultivated in such a way as to enhance the *microbial life* in it.

Dr. George S. Oliver, author of "Our Friend, The Earthworm," expresses this basic philosophy more in detail as follows: "Most soils are deficient in elements necessary for plant life, not because the elements are not present, but because they are unavailable to the plant roots. *All* the elements that are in the soil, but which are hidden and unavailable to the plant roots, are broken down by the earthworm and made available. In this invertebrate animal Nature has provided a perpetual soil builder, a four-in-one creature that acts upon the soil as a chemist, triturator, cultivator, and distributor of plant food."

In these two major divisions of *soil life*—the beneficial aerobic bacteria, and the earthworms, we have a team on every acre of fertile, humus-filled soil weighing upwards of 2,000 pounds. And this wonderful team not only cultivates, aerates and triturates the soil—it actually manufactures its body weight of the finest organic fertilizer every twenty-four hours! In addition to all this, a living, fertile soil, with its army of aerobic bacteria, is also engaged in the manufacture of powerful weapons of defense against disease. (See Leonard Wickenden's article entitled. "The Hidden World", *Organic Gardening*, November, 1948)

Scientists tell us that each gram of fertile soil contains upwards of 2,000,000,000 of these tiny beneficent workers. This defense mechanism, manufactured by the soil bacteria for the protection of our crops, is in the form of mysterious "antibiotic substances"; and their mission is to destroy, disarm, or to render innocuous, the host of destructive, disease-producing bacteria, which we call "pathogenes". These pathogenes, if left unchallenged in the soil, would overrun our orchards and fields, bringing in their harvest of disease and death. Some of the best known and more potent of these antibiotic substances, discovered by men of science within recent years are: Penicillin, streptomycin, and choloromycetin. The last, first discovered in a mulched field, near Caracas, Venezuela, will destroy such virulent and dreaded disease organisms as those which cause Rocky Mountain spotted fever, undulant fever, typhus, and typhoid, etc.



COMPOST THERMOMETER
L. H. Larsen,
1710 Nob Hill Blvd.,
Yakima, Washington.

In view of all this, how careful we should be to conserve, and feed and shelter this wonderful LIFE in the soil. How diligent we should be to avoid any agricultural procedure that would destroy or hinder the activity of this beneficent fauna in the garden or on the farm.

According to such noted soil scientists as the late Sir Albert Howard, of England, Dr. Ehrenfried Pfeiffer, internationally-known Swiss agronomist, and Dr. Norman W. Walker—a fertile soil is a LIVING SOIL. A living soil is a healthy soil, and a healthy soil will produce disease-resistant, disease-free plants. In Biological Soil Building, therefore, we have the practical answer to one of Agriculture's most perplexing and baffling problems—a large measure of immunity from disease.

3. *Freedom From Insect Pests.*

Can Biological Soil Building rid us of the ever-present insect pest? According to modern scientific research, sick soils mean sick plants—and sick plants like sick people are wide open to attack from a multitude of foes. On the other hand, according to Dr. Charles Northern, of Florida, who gave up his medical practice to enter the "more important" field of Creative Medicine,—a healthy plant, grown on a balanced, fertile soil, "can and will resist most insect pests."

To demonstrate this, Dr. Northern gave some of his case histories. "For instance, in an orange grove infested with scale, when he restored optimal fertility to part of the soil, the trees growing in that part became clean, while the rest remained diseased. By the same means he had grown healthy rosebushes between rows that were riddled with insects. He had grown tomato and cucumber plants, both healthy and diseased, where the vines had intertwined. The bugs ate up the diseased and refused to touch the healthy plants!"

Dr. William A. Albrecht, noted soil scientist, in a series of carefully controlled tests, showed that spinach grown on fertile soil resisted the attack of thrips, while that grown on poor soil was destroyed by these little enemies of agriculture.

My own experiments in Gardena and Paradise have helped to bolster up my faith in a "Soil-building" program as opposed to a "pest-extermination" program in the garden or on the farm. In Gardena we grew five kinds of apples over a period of as many years without finding a single wormy apple! All this without the use of an ounce of dusts or sprays to hold the destructive and ever-present coddling moth in check. If space permitted I could give you many thrilling stories from Organic Gardeners in half a hundred districts, all the way from the Canadian border on the north to the Gulf of Mexico on the south, testifying to the power of Nature, and the ability of trees, vines, and field crops to resist the "pests".

Last week I spent two wonderful hours with a prominent scientist and author, Dr. Norman W. Walker, of Anaheim. Dr. Walker holds a Doctor of Science degree, and he is also a Medical Doctor. Among a hundred other questions I asked him: "Why is it, Doctor, that an insect pest will attack and destroy a sickly, under-nourished plant, and leave a well-nourished, healthy plant alone?"

"The so-called pest," replied Dr. Walker, "is a scavenger—sent by Nature to destroy and remove from the face of the earth that which is *unfit* for food." With the decrease in Natural Soil Fertility comes a corresponding decrease in the basic health of the plant. With the lowering of basic health comes a lowering of the vibrations in the molecules of the cell. The cell structure becomes unsound and unbalanced—diseases multiply, and the "scavenger" promptly appears to finish up the job, and the "victim" is removed from the land of the living.

"On the other hand, the higher the state of health, the higher the vibrations," explained Dr. Walker, "and the 'pest' whose vibrations are on a lower level, receives a distinct shock when he comes in contact with the healthy plant." Just as the light shock of an electric fence will keep the horses and cattle in the pasture where they belong—so the well nourished, healthy, vibrant tree or vine will keep the so-called "pest" where *he* belongs. And that means it will keep him *out!*

"Of course, this line of agricultural research is only 200 years ahead of our time", says Dr. Walker, "so you probably won't believe anything I say." But wait a minute, my friend, before you consign his philosophy to the ash-can. Mr. Arnold P. Yerkes, Soil Scientist, heading up International Harvester Company's Farm Practice Research program, presented the same line of thought two years ago to a group of our doctors and staff of the new Feather River Sanitarium project. He told us plainly that this phase of Agricultural Research was going into the field of Electricity. And now, Dr. Norman Walker tells us the same story in a little different language. He confirms every word presented to us back in 1947.

Sir Albert Howard, Father of the Organic Gardening Movement throughout the world, expressed the same basic philosophy when he called the insect pest—NOT AN ENEMY, but Nature's Censor, to remove the anemic and the sickly from our agricultural economy, and at the same time perform the office of "Signalman" to warn us of the lowered fertility and diminished power of our soils, and to admonish us to quickly correct and remedy the deficiencies which the presence of the so-called "pest" reveals.

This basic philosophy also seems to agree with the remarkable statement found in the book, *Ministry of Healing*, page 127, where we are told: "Disease is an EFFORT OF NATURE to free the system from conditions that result from a violation of the laws of health. In case of sickness, the *cause* should be ascertained; unhealthful conditions should be changed, wrong habits corrected. Then NATURE is to be assisted in her effort to expel impurities, and to establish right conditions in the body."

Medical men who also operate fruit farms in Southern California have told me that every law of Nature that applies to the human body, applies with equal force to the plant, vine, or the tree. In other words, if we are to free our orchards from disease and insect pests, we must free the trees from malnutrition and other conditions that result from a violation of Nature's immutable laws. Conditions that are unhealthy to the tree should be changed, wrong practices corrected. Thus Nature will be assisted in her effort to expel the invader and re-establish right conditions in the orchard.

4. *Freedom From Crop Failure—Freedom From Want.*

With a large measure of FREEDOM from the traditional enemies of present-day Agriculture—soil erosion and loss of fertility, disease, and insect pests, there comes a corresponding increase in production yields—both from garden and orchard and field. Freedom from Crop Failure spells SUCCESS—ECONOMIC SECURITY on the farm. And that is what each and every city-dweller who contemplates a future life on the farm is looking and hoping for.

Thus, through the simple expedient of cooperating *with* Nature, instead of *fighting* her—building the power and life in the soil, instead of destroying that life, we have solved in a large measure four of the most difficult problems of Rural Living;

(*Continued on page* 56)

Country Estate of
Mr. and Mrs. Robert P. Fenstermacher
Allentown, Pa.

Spacious lawns with century old trees grace the garden. Perennial flower beds present color and design. Delphiniums, iris, peonies, lilies, and phlox are practical and beautiful.

Easter Arrangement

Semanticists tell us that the word "Easter" is derived from *Eastre,* the Teutonic goddess of dawn and the springtide.

We salute the coming of the lovely lady with a gay and vivacious nosegay of seasonal posies — pink tulips, blue iris, yellow daisies, Easter palm, acacia, and figurine.

Bouquets, bonnets, and bunnies are synonymous with the Easter holiday and spring.

Arrangement by Mrs. Philip Berman

Growing Strawberries Successfully *with Mulches*

by HENRY JOHNSON, JR.

ONE OF the first fruits to appear in the spring is the well known and universally accepted strawberry. There are few localities that do not have their share of strawberry patches, whether they be back-lot affairs or extensive commercial acreages.

During the past few years it has become increasingly difficult in some localities to combat the myriad diseases and pests that have well nigh cleaned out strawberry plantings in some areas. To meet this problem new varieties have been developed, new sprays invented and costly methods have been devised. Even with all this the problem has not been solved. You cannot dump more poisons into the soil and expect to reap lasting dividends. By developing new disease-resistant varieties you may in a way get around the issue, but flavor and quality in general are sacrificed.

To meet some of these conditions, we have stumbled onto a simple plan; at least it has been quite simple and effective in its results in local trials. The strawberry is a plant that requires for its best growing conditions a well drained location, preferably a slope. Yet it demands plenty of moisture, especially during its productive period. This is especially true in the case of everbearing varieties. Also, a soil rich in humus and organic material is desired so as to have the best possible results.

We have found first of all that best results can be had on ground that is prepared in the fall and allowed

to lay over winter. Better still, seed the ground to vetch and rye or vetch and oats. This will hold winter erosion down to a minumum besides adding additional organic material. If well rotted manure is used, we prefer to fertilize the cover crop which precedes the strawberries and let the strawberries feed on the decayed cover crop. The ground should then be plowed again in the early spring and well worked. Then as soon as is advisable in your locality (the earlier the better) set out your berry plants. Be sure you have healthy well rooted planting stock and a variety suited to your locality. Space does not permit giving different planting methods but we prefer the hill system if the most in fruit is wanted. Be sure the plant is set in firm and that abundant moisture is available either in the soil or added at time of planting. Many failures can be traced to the young plants drying out after planting.

Now that your plants are in, it is important that you keep them free of weeds by either hoeing or cultivating, or both. We have been using a rotary-type tiller that has no wheels. There are many different machines on the market and this is usually up to the berry grower as to which he prefers. As stated, we use a wheelless machine. To us it is a gardener's dream come true, as it will cultivate close to crops, much closer than wheeled machines, yet not injure the plants. There are two makes of these wheelless tillers on the market and the price is within reach of most small gardeners.

We keep our new plantings well worked for about six-weeks or until the young plants have had a good start. Then comes this simple plan we spoke of, that of mulching. The materials used in mulching will, of course, be what you can find near at hand and yet what will be beneficial to your soil.

There has been much said of late in regard to using sawdust as a top mulch. We have tried this, using red fir as it was readily available. Our experience of using sawdust was very satisfactory. However, adverse effects may follow for the succeeding crops. By this I mean that after the old bed of strawberries is plowed under, the sawdust is then no longer on top but incorporated with the soil. It is therefore advisable to use a liberal quantity of compost or other organic material and we have found an intervening cover crop using some legume to be a good practice. Sawdust after being incorporated into light soils tends to dry them out. Furthermore, where the open ditch system of irrigation is used, sawdust being nothing more than ground up wood will naturally float off. To add to this, if a matted row system is being used the runner plants do not readily root in sawdust unless the top is kept moistened by abundant rain.

We have found that there are other materials which answer better than sawdust, such as pine and fir needles, manzaneta and laurel leaves,

(*Continued on page* 58)

Vitamins, Growth Substances, Hormones to the Soil

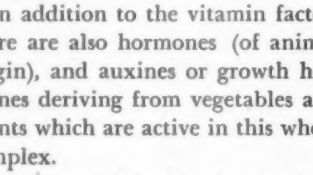
by DR. EHRENFRIED E. PFEIFFER

THAT vitamins are necessary for the growth and health of animals and human beings is common knowledge. That vitamins are active in the soil and in the growth of plants is less known. In fact, the soil and plant vitamin problem has been studied very little so far. It is the intention of this article to report on the knowledge which has come to light up to the present.

To introduce the problem let us talk first about the so-called "orchid" factor. Orchids live in symbiotic relationship to their hosts. They require a specific fungus for germination and development. This fungus grows with its mycelium (mycelium: a vegetative organ of fungi similar to the root mass in higher plants) within the cells of the embryo. This relationship is called mycorrhizal (from two Greek words stems, *mykes* —myco—fungus and *rhiza*—rhiz or rhizo—root). Such mycorrhizal relationships are known to exist for many trees, especially forest and fruit trees, by the way. At first, it seemed that orchids would not grow, particularly on synthetic media, unless the fungus mycelium was present. Then it was discovered that under certain conditions Cattleya could grow without the fungus. High concentrations of sugar also aided the growth of certain species. Then it was found that extracts of the fungus activate the orchid growth just as well as the fungus itself. To make a long story short, a vitamin growth factor is now believed to be responsible. Now comes a very important discovery (made by Schaffstein in 1938), that a small amount of tissue extract of the leaves, stem and root of beans (Vicia faba, broad bean or horse bean), of the coleoptile and vegetative tip of oats, and extracts of *Rhizoctonia mucoroides,* of baker's and wine yeasts, do the trick too. The size of the dose is important, too small ones are ineffective, too large doses even have the opposite effect and inhibit growth. The extract from seeds of vetch is even more powerful than the original fungus symbiosis. 0.04% to 5% seems to be the range of favorable action. Purified extracts of the "orchid" factor, which cannot be replaced by vitamins B1, B2, A and D, act best in a concentration of 1:100,000, and are still discernible in concentrations of 1 part per million.

In addition to the vitamin factor, there are also hormones (of animal origin), and auxines or growth hormones deriving from vegetables and plants which are active in this whole complex.

Legume nodule forming bacteria require the co-enzyme R, replaceable by biotin (vit H); thiamin (vit. B1) plays a role too. *Rhizobium meliloti,* the legume bacteria of sweet clover, produces pantothenic acid (a growth stimulating substance). In parenthesis, we may mention that there also exist interesting symbiotic relationships between fungi or yeasts and insect larvae. The larvae of a certain wood boring beetle for instance need yeast symbionts, without which they do not grow. Yeast and wheat germ extract, however, provide an acceptable substitute. Drosophila flies also require yeast. Many insects need niacin; mosquito larvae need both thiamin and riboflavin. To return to the "orchid" factor, one of the most remarkable things about it is its resistance to heat; it survives heating up to 324 degrees Fahrenheit for 2 hours. Present knowledge indicates that this "orchid" factor is due to the "concerted" effect of vitamins B1, B2, B6, bios and an as yet unidentified B group vitamin.



Nitrogen fixing bacteria like *Azotobacter* and *Rhizobium* are important sources of such growth factors in soil. Already, between 1914 and 1918, Bottomley and Mockeridge pointed to the effects of such "auximones", as they were called at that time, in bacterialized peat. Certain soil fungi cannot grow without thiamin, which they take from the microlife in soil. The "soil" factor can be extracted with acid alcohol and adsorbed on animal charcoal. It has also been observed that the soil is richer in it near the surface than in the deeper layers. Thiamin was found near living and decaying plant matter in the surface layers. *Azotobacter* contains 70 milligrams of thiamin per pound. Roots even allow amino acids to diffuse in the soil. Conifer seeds which decay in soil have a similar effect, so do pollen and blossoms. It has been observed, for example, that the pollens of willows, birches and alder have a stimulating effect upon bulbs, when decaying in the soil near them. To

this category may also belong the effect which scilla and digitalis have upon vegetables which are grown in their neighborhood. Such vegetables last longer and wilt less readily after cutting. Here, however, the presence of alkaloids may have something to do with this too. Large amounts of thiamin have been found in dog and cat manure, in human feces and urine. It is well known that stinging nettle, elder, lilac and blackberries grow luxuriantly in the neighborhood of all such droppings and near outhouses. Steer and dairy cow manure contain 0.13 parts per million of thiamin.

Russel states: "The presence of growth factors in natural manures must contribute to their superiority as compared with artificial fertilizers. This superiority has been established for a long time." * He also says "that soil must act because of substances other than those of inorganic nature".

Many plants are helped by the presence of thiamin, such as Bougainvillea, Eucalyptus, *Arbutus unedo, Bryophyllum,* and *Prunus ilicifolia.* The vitamin accumulates in the leaves of the treated plants, another reason for collecting and composting leaves instead of burning them. The horticulturist may be particularly interested in this information.

This cycle of vitamin action revolves from higher plants to animals, to manure (or compost), to the soil, to the microlife in soil, to plant roots and back to the leaves. A similar cycle for carotene and vitamin A has been observed in marine algae and crustaceans. This points toward the favorable qualities of kelp, crustacean and shrimp composts. Urine in general is rich in auxines. Cow urine should always be saved on this account, therefore, as well as for its high potassium content. Because of its content of different sex hormones, the urine from cows influences the development of the female blossom in corn, while the urine from bulls stimulates the development of pollen in corn. (What about steers, the writer asks?) Pigeon manure stimulates the budding of Begonia leaves. Rowlands and Wilkinson reported in 1930 (Vitamin B1 content of grass seeds in relationship to manures. Biochem. Journal 24-199.) that the thiamin content of grass seeds is lower when grown with artificial fertilizer than when grown with manure. Wheat bran is very rich in thiamin, i.e. almost all of the wheat seed is found there. Rice and barley contain 35 parts per million. Rye and corn contain less, about 10 to 12 parts per million. Oats are richest in thiamin. Old timers in Scotland used to sow germinated oats in the planting holes for fruit trees, a practice which was looked upon as "superstition" for a time. Now we understand that this practice had a very good reason.

Scheunert and Schieblich demonstrated over a three year period (1936) that oats contained a little more vitamin when grown with fermented manure as against fertilizer. Rye and barley, peculiarly enough, had the highest vitamin content when grown without any fertilizer. It is also a fact that farmers used never to grow barley right after manure in their crop rotation.

It is known that many fungi need growth hormones in order to develop spores; without these they remain in the vegetative phase. An unnamed factor (Z1 and 2), which stimulates the sporing phase of certain fungi, is contained in potatoes. (Why do you burn your potato leaves instead of making compost!) Z1 has since been identified as hypoxanthine. There is still much to be learned about these relationships. Care must be taken in the use of all these growth promoting substances, since doses which are too small have no effect and very big doses result in the opposite—inhibition. Thorough experiments must be made in order to establish safe rules for their use. In a compost pile and in connection with humus, Nature produces a sound balance.

The female sex hormone "estrone" is also found in plants. It has, therefore, not only the hormone character (animal nature), but also a vitamin character (plant nature). A Swiss mountain grass, *Poa alpina,* propagates itself by seeds as well as by little bulbs which develop in the angle where leaf and stem meet. The female hormone, applied as a spray on it, increases the number of the vegetative bulbs by 96% with the optimal dose, but not the flowers. It also effects an increase in the dry matter content. The question arises in the mind of the writer whether we will not one day discover that the female hormone in manure and urine has a stimulating effect upon hayfields and pastures. We observe with composted manure applications on pastures that these remain green much farther into winter. In general, estrone increases the dry matter content of plants such as tomatoes, wheat, corn, barley, rye, and horse beans, while in other plants the blossom is influenced. The blossoming of bulbs, hyacinths, fuschias and primroses was increased. Tomatoes developed larger fruit. It may be that one day we will go over our fields with the spray-rig applying highly diluted cow urine instead of poisonous sprays.

Prolan A (a hormone from the anterior lobe of the pituitary gland) has a marked effect upon root growth in certain cases and upon the growth of rye shoots. An increase in the mineral content of plants has also been observed in this connection. Estrone, by the way, is found in palm kernels, and a related substance in the pussy willow.

(*Continued on page* 60)

* These and other data are from W. H. Schopfer's *Plants and Vitamins,* Chronica Botanica. Waltham, Mass., 1949.

HOW—

To Grow Your Own T

1. Prepare the soil by enriching it with well-fermented compost and pulverized phosphate and potash rocks. The soil should be soft and friable, and tend to fall apart after being squeezed in the hand as shown in the illustration.

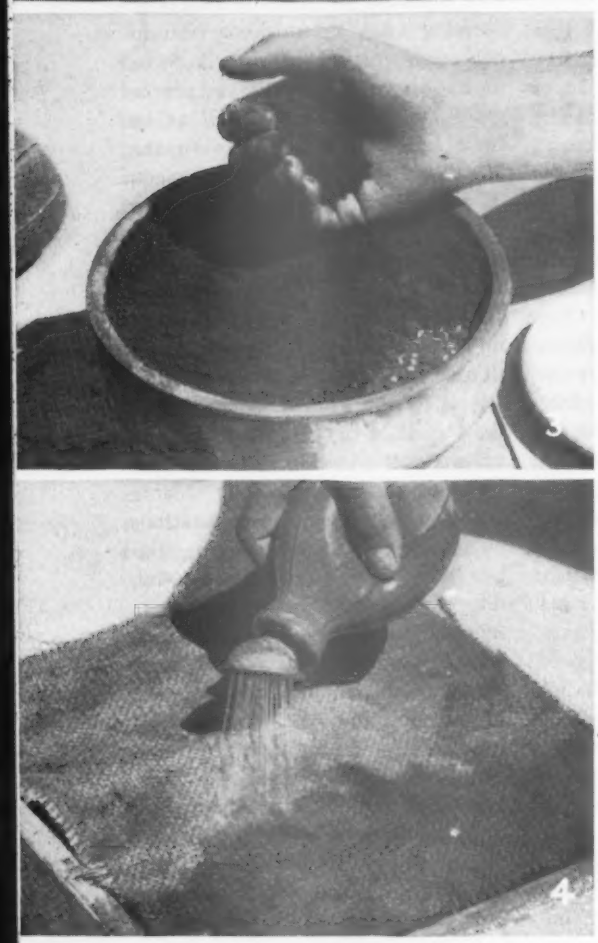
2. Fill a flower pot or wooden flat to within a half inch of the top with the soil, as shown in the photograph. Scatter the seeds over the soil, using the packet as a seeder.

3. Cover the seeds with a thin layer of soil, using the hand to distribute the soil uniformly.

4. Cover the flower pot or wooden flat with a piece of burlap, and water with a syringe until the soil is thoroughly wet. The burlap prevents the seeds from being washed out by the streams of water.

5. When the tomato seedlings have developed their first true leaves (the first leaf-like structures are the seed leaves or cotyledons), they should be transplanted. First water the plants thoroughly so that they can be taken out of the soil without injuring the root systems. A pencil or pointed stick (dibble) should be used in removing the seedlings, as shown in the picture.

6. The young seedlings should be transplanted into wooden flats. First fill the flat with a mixture of equal parts of compost and sand. With a pencil, make holes about 2 inches apart each way. Carefully insert the root and gently press the soil about the plant as shown in the photograph.



By WILLIAM H. EYSTER, Ph.D.

Tomatoes from Seeds

7. The newly transplanted tomato seedlings should then be watered thoroughly so that the soil settles firmly around the roots. This can best be done with a small syringe, as shown in the illustration.

8. When the tomato plants are 4 to 6 inches in height, they may be transplanted into the garden: The plants shown in this picture are ready for transplanting. Notice that the plants are short and stocky. To grow such tomato plants, keep the young transplants in a place where the light is bright and the temperature is from 60 to 65 degrees F.

9. Remove the young plant from the seed flat with a trowel in such a way as to have a liberal amount of soil around the root system. The hole in the garden soil into which the plant is to be set should first be filled with water. As soon as the water has drained down into the soil, set the tomato plant in the hole as shown in this photograph.

10. With the hands, pull the soil around the plant and press it down around the plant gently.

11. The growing plants may be mulched heavily with straw or other plant material and allowed to remain prostrate, or the plants may be supported with stakes. A good plan is to tie four stakes together. The tomato plants may then be pruned and tied to the stakes.

12. Cutworm damage can be prevented by placing a paper collar around the stem. This collar should extend about an inch above and below the level of the ground.

The New Organic Method in the Garden

by WILLIAM H. EYSTER, Ph.D.

VEGETABLES rich in minerals, vitamins, and other health-promoting qualities can be grown only in mineral-rich, living soil. The vegetable gardening should be begun in the fall as soon as the garden crops have been gathered and stored for the winter. All garden residues should be shredded and spread over the soil. Additional organic materials as shredded leaves, ground corncobs, manure, shredded weeds (which have not yet gone to seed) and many other kinds of plant residue should be placed on the garden to a thickness of from 4 to 12 inches. This layer of shredded plant materials will form a winter mulch that will protect the soil from freezing and thawing, prevent erosion, absorb and hold rain and snow, protect and feed soil organisms, and return to the soil such minerals that may be washed out of the mulch by rain.

Under such a winter mulch, the soil will freeze little or not at all. The soil will become soft and friable, so that plowing and digging may be unnecessary. When planting time arrives, the mulch may be raked off the soil, or raked out of the row spaces and heaped in the inter-row spaces if neither plowing nor digging are to be done. Under the mulch, the ground will warm up somewhat more slowly in spring, but usually early enough for timely planting. You may want to refer to frost maps and planting tables, but it is good practice to plant just as soon as soils are sufficiently warm and dry.

In putting down the winter mulch, it is an excellent idea to remineralize the soil by adding finely pulverized phosphate rock and potash rock, each at the rate of about 2½ pounds per 100 square feet. In addition to such major and minor elements as calcium, phosphorus, potassium, magnesium, iron, and sulphur, these rocks contain the highly essential trace elements.

During the fall and winter, the organisms in the soil will feed on this protective mulch and convert much of it into compost and eventually humus. The soil will be living and have an abundant reserve of water and minerals.

The green plant is a machine which uses light as a source of power. Vegetables are plants which have been selected for their capacity to build organic compounds from carbon dioxide taken from the air and water and minerals taken from the soil. Mineral-rich vegetables are nutritious, but cannot be grown in soils which lack one or more of the essential elements. A vegetable grown in a depleted soil may appear to be normal, but may have little nutritional value. The more common constituents of some vegetables are given in the table on page 42.

The water content of the edible parts of the above vegetables varies from approximately 74 to 96 percent, thus emphasizing the extreme importance of water. The mulch on the surface and the humus in the soil absorb and hold the water necessary to grow luscious vegetables. The carbohydrates vary from 3.2 to 23.5 percent, fats from 0.1 to 1.2 percent, and the protein from 0.7 to 7.5 percent. The sugar content is surprisingly high in some vegetables and makes one wonder why artificially manufactured sugars are used at all in the diet.

Perennials

Plants which live as perennials in the garden, as asparagus, dandelion, and strawberries may well be grown together at one end of the garden area. These plants should be given a finely shredded mulch between the rows, and a loose, non-packing, winter mulch over the entire area occupied by the winter residents in your garden. When all danger of freezing is past, the winter mulch should be removed and the mulch between the rows increased if necessary. Digging and cultivating should not be necessary.

Annuals and Biennials

Plants which grow from seed and produce seed the same season are called annuals. Plants which develop a fleshy root the first season, and flowers and seeds the following season are called *biennials.* Our common root crop garden plants are biennials. In the garden root crops are grown as annuals, because the fleshy roots are harvested in the same season the seeds were sown. However, some roots may be left in the soil over winter, especially if they are covered with a winter mulch.

Plants which form their leaves close to the ground as endive, lettuce, beets, carrots, and onions need to be mulched with plant materials that have been finely shredded and passed through a wire screen. The mulch can be thickened as the plants increase in size. If necessary to control weeds, mulches which pack somewhat, as sawdust, may be used in addition to the finely screened plant-materials.

As the taller-growing plants increase in height, the mulch which was removed from the garden area or which has been heaped in the spaces between the rows, should be spread over the soil around the plants to prevent the growth of weeds. Plants which should be handled in this manner are corn, cabbage and its allies, beans, peas, and tomatoes.

Potatoes should be planted in the soil and covered only lightly. As soon as the planting is finished, the entire area occupied by the potatoes may be covered with a fairly light mulch, as old straw, to a thickness of about one foot. It is important that this mulch be applied immediately. The elongated potato stems will grow up through the straw and then spread out over its surface so as to completely cover it. If the planting has been properly done, the next operation will be the digging of the potatoes in summer or early fall.

The new method reduces the work necessary to have a successful garden to a minimum, and permits more time for enjoyment. It also insures an abundant crop of fresh vegetables filled with minerals, vitamins, hor-

Mineral Content of Some Common Vegetables

Vegetable	CONTENT IN PERCENTAGES								
	Water	Protein	Fat	Ash	Calcium	Sugar	Starch	Fiber	Total Carbohydrates
Asparagus	93.0	2.2	.2	.67	.021	1.3	.4	.7	3.9
Snap beans	88.9	2.4	.2	.77	.065	.4	2.2	1.4	7.7
Lima Beans	66.5	7.5	.8	1.71	.031	.. ..	.... ..	1.5	23.5
Beets	87.6	1.6	.1	1.11	.026	.. ..	.... ..	.9	9.6
Broccoli	89.9	3.3	.2	1.10	.146	1.9	.... ..	1.3	5.5
Brussels Sprouts	84.9	4.4	.5	1.28	.025	.. ..	.... ..	1.3	8.9
Cabbage	92.4	1.4	.2	.75	.045	3.5	.... ..	1.0	5.3
Carrots	88.2	1.2	.3	1.02	.042	7.5	.... ..	1.1	9.3
Cauliflower	91.7	2.4	.2	.85	.025	2.6	.... ..	.9	4.9
Celery	93.7	1.3	.2	1.08	.072	1.2	.... ..	.7	3.7
Cucumber	96.1	.7	1.0	.44	.010	2.6	.... ..	.5	2.7
Dandelion	85.8	2.7	.7	2.00	.113	.7	.2	1.8	8.8
Endive	93.3	1.6	.2	.89	.074	.. ..	.... ..	.8	4.0
Kale	86.6	3.9	.6	1.70	.181	1.2	.2	1.2	7.2
Kohlrabi	90.1	2.1	.1	1.05	.078	2.2	.... ..	1.1	6.7
Lettuce	94.8	1.2	.2	.01	.054	1.6	.... ..	.6	2.9
Onion	87.5	1.4	.2	.58	.032	6.7	.5	.8	10.3
Parsnip	78.6	1.5	.5	1.15	.057	9.5	2.4	2.2	18.2
Peas	74.3	6.7	.4	.92	.022	3.2	8.2	2.2	17.7
Radish	93.6	1.2	.1	.95	.037	3.4	.... ..	.7	4.2
Spinach	92.7	2.3	.3	1.50	.083	.3	.... ..	.6	3.2
Sweet Corn	73.9	3.7	1.2	.66	.009	4.3	14.6	.8	20.5
Tomato	94.1	1.0	.3	.57	.011	3.4	.... ..	.6	4.0
Turnip	90.9	1.1	.2	.73	.051	4.6	.... ..	1.1	7.1
White Potato	77.8	2.0	.1	.99	.013	.9	14.7	.4	19.1

mones, and other health-giving substances as yet little understood.

Some vegetables which are grown in most gardens are especially rich in all the common vitamins as, for instance, asparagus, lima beans, broccoli, dandelion, endive, kale, and turnip tops. Others, as celery and cucumbers, are low in vitamins. The vitamin content of all vegetables will be considerably higher in plants grown in a living, mineral-rich soil.

Vitamin Content of Some Common Vegetables

Vegetable	Vitamins			
	A	B1	B2	C
Asparagus	••	••	••	••
Snap Beans, Green	••	••		••
Yellow		•	••	••
Lima Beans	••	•••	•••	••
Beets	•	••	•	
Broccoli	•••	••	••	•••
Brussels Sprouts	•	••	••	••
Cabbage	•	••	•	•
Carrots	•••	••	•	•
Cauliflower	•	••	••	•••
Celery	•			
Cucumber	•			
Dandelion	•••		••	••
Endive	•••	••	••	••
Kale	•••	••	•••	•••
Kohlrabi		•		•••
Lettuce, Leaf	•••	••		••
Onion			••	••
Parsnip		••		••
Peas	••	•••	••	••
Radish		•		••
Spinach	•••	••	••	•••
Sweet Corn	••	••	••	•
Tomato	••	••		••
Turnip Tops	•••	••	•••	••
Potato		••		••

CANCER P

IN PART A of this section I gave the views of many physicians regarding the ill-effects on the human system of sugar. I now would like to discuss or quote from a publication by Paul H. Belding, D.D.S and L. J. Belding, M.D., entitled *Dental Caries*, from the Research Department of Upper Iowa University. I know both of these men personally and am familiar with and have always admired their work and research on the health and welfare of human teeth. Paul Belding is editor of the old established dental journal called *Dental Items of Interest*.

The Beldings attack the use of industrial sugar as being a cause of serious disturbance in the alimentary tract which starts in the mouth. Let me quote:

"Human experience suggests that it is not excessive indulgence in carbohydrate *per se*, but generally the addition of one specific carbohydrate, namely refined sucrose, to any kind of a diet, which leads to the production of *caries acuta*. This observation is well supported clinically, experimentally, and by anthropological investigations. The Michigan School, under the dynamic guidance of Bunting, has shown that in institutions over which it had rigid control of diet, the initiation of caries could be caused, or the activity of this disease terminated, simply by the addition or deletion of candy from the diet.

"The Iowa Group, under the no less brilliant leadership of Boyd and Drain, by making use of a diabetic diet, though not subscribing to the Michigan explanation, have confirmed Bunting's observation that caries can be controlled clinically by the use of diets low in sucrose.

"Waugh in his noteworthy studies was perhaps the first one to produce intentionally experimental caries in humans and to establish conclusively that without sucrose caries acuta does not occur. In feeding experiments among the primitive Eskimos,

RPart XII—SUGAR —(B)

By J. I. RODALE

Waugh, excluding sucrose, found that they could eat any carbohydrate including white flour and the natural sugars without developing dental decay. He further observed that with no other change in the diet, except in the addition of sucrose, caries almost invariably developed. These observations were so striking that this author coined the phrase, 'An unsweetened tooth cannot decay'."

"Most investigators have erroneously assumed that sugar was harmful because it could easily be converted into acid. Primitives can eat corn, potatoes, cabbage, bananas, apples, beans, and other easily fermented carbohydrates and remain caries free, yet let them add small amounts of the *hard to ferment sugar* and their teeth undergo rapid destruction. Sucrose is primarily dangerous, not as a source of acid, but by reason of its activating influence upon the oral streptococci. Before sugar is added to the diet, these organisms do not have sufficient fermenting power to produce enough acid from any of the carbohydrates to cause smooth surface dental caries. Sucrose specifically stimulates the fermenting ability of the oral streptococci and alters the floral enzyme mechanism to such an extent that after this material has been added to the diet, the organisms can produce sufficient acid from any of the carbohydrates to cause dental caries."

It is important that I give as much as possible of the Beldings' ideas for their work is of the utmost significance in the consideration of human health. In some cases I will quote word for word and in others I will give you their thoughts in my own, more simplified words, translating the technical and medical terms.

"The saliva of dogs, cats, cows, mice, rats, and other animals, breast fed babies, and all others subsisting upon a primitive diet is not a high acid producing mechanism. Saliva samples obtained from these sources can be incubated with any carbohydrate and the resultant action is weakly acid or alkaline. In contrast to this, the saliva obtained from *any human* subsisting on a modern diet will, on incubation with the carbohydrates, rapidly produce sufficient acid to decalcify the teeth. This observed difference in the fermenting power of the saliva samples from these two groups, civilized and primitive, makes it apparent that they are not alike in their bacterial content. It is this difference in the fermenting power of the saliva which is generally induced by sucrose, (sugar)."

This action, is for all practical purposes, exclusively initiated by certain bacteria in the mouth, the oral streptococci. Once the streptococci have been converted from low acid production to high acid production under the selectively stimulating action of industrial sugar, they are able to convert practically all carbohydrates, including sucrose (sugar), and perhaps protein, into sufficient acid to cause tooth destruction.

Cavities of the teeth, called dental caries, or more technically, *caries acuta,* are caused by specific, infectious, contagious, bacteria initiated by the action of the streptococcic bacteria mentioned above.

Caries acuta obeys general bacteriological law in much the same manner as do the other infectious diseases, such as scarlet fever and diphtheria. Following the ingestion of the modern diet, these changes in the bacteria occur not only in the mouth but throughout the intestinal tract. It is for this reason that we have named the syndrome, which results from eating sucrose, *alimentary streptococcicosis.* The manifestations of this disease are multiple and varied and its implications extend far beyond the ramifications of the oral cavity. It is probably this activated streptococcus, as postulated by Ashoff, which causes appendicitis and lymphoid hyperplasia to be practically universal diseases in civilized communities. Modern man lives in a state of perpetual siege with pathogenic organisms! No wonder he is alleged to be delicate."

This work of the doctors Belding is of far-reaching implications. Why did not the American Indian get appendicitis, nor the Hunzas and hundreds of other primitive peoples? That there might be a connection between appendicitis and the taking of industrial sugars is a fact worthwhile further study by the medical profession. I am sure it can easily be discovered that behind each appendectomy lies a violent liking for sweets. But, when the Beldings speak of lymphoid hyperplasia they are coming closer to cancer, for lymphoid hyperplasia means an abnormal multiplication of the cells of the lymph of the blood.

The Beldings state that ordinarily the streptococcic bacteria in the digestive system are harmless, in fact helpful to the extent that they oppose the colonization of harmful bacteria, tending to convert them to an innocuous form. These organisms live in intimate biologic relationship with the mucous membranes, where they are present in enormous numbers. They are the most frequent bacteria found in the saliva of man or animal. They live in a state of uncertainty and under the influence of the environment they are constantly undergoing involuntary and evolutionary change. The chief factor determining the direction of their growth is diet. We may be what we eat, but bacteria certainly are what we feed them. It may be more apropos to say that we are

what we feed our bacteria. Of all the foods consumed by man, sucrose (sugar) is the only one which alters the streptococci rapidly and significantly enough to induce variation.

The streptococcus of the infant, especially if it is breast fed, is low acid producing and it cannot break down the sugar molecule, but gradually, by changes in diet, the taking of sugar especially, special ferments or enzymes are developed in the saliva which can readily break down sugar. The Beldings have discovered that after sugar has changed the streptococcus into an organism called *S. odontolyticus,* the latter begins to convert almost any food into sufficient acid to cause caries (cavities in the teeth). This explains why primitives can eat large amounts of easily fermentable carbohydrates and yet remain caries free. Their saliva does not contain a high acid producing bacterial mechanism. In civilization the alteration in the bacteria of the mouth causes white breads and pastries to ferment and to serve as the chief source of acid for the leaching of the enamel of the teeth. (This is the end of the Beldings' thoughts which I have simplified somewhat.)

In my opinion the work of the Beldings' is of great importance in the prevention of cancer because it shows that by taking sugar there is a serious interference with the natural functioning of the digestive processes, by changing a beneficial bacteria to a harmful one. The whole body is dependent for its welfare on the performance of the stomach, which in delicate and subtle ways prepares the food distribution for the blood and the organs of the body. The efficient operation of each cell depends on the manner in which its food is broken down in the digestive tract. The slightest change, may be a disturbing factor in preventing the cells from functioning efficiently.

In *Life and Health Magazine* for March 1948 another effect of sugar and bacteria is given which is pertinent to our discussion. It states that the requirements for vitamins vary with the kind of carbohydrate used in the diet. In all studies where cane sugar was the carbohydrate given, the vitamin requirement was the highest. Sugars that are converted from starches and other natural sugars are the carbohydrates that give the most sparing effects upon the vitamins. The reason is this—many vitamins are manufactured in the intestinal tract, but to accomplish this, a friendly bacterial condition must be present in the intestine for the growth of the bacteria which are responsible for the synthesis of the vitamins. But the proper bacteria cannot thrive without certain carbohydrate products, and evidently these products result from carbohydrates such as starch that break down and absorb slowly. White sugar is rushed out of the digestive system too fast for the bacteria to work on them.

I would like to merely mention here about the researches of Dr. Benjamin P. Sandler of Oteen, N. C. who in a letter to the New York *Times* (May 21, 1949) said: "There is strong evidence indicating that sugars are not only inferior foods but may also be harmful to the human organism." Dr. Sandler has projected the theory that the taking of sugar is one of the causes of polio. In a recent issue of *The Journal of Medico-Physical Research* appears the following statement:

SUGARLESS DIET AIDS POLIO FIGHT

"Dr. Benjamin P. Sandler of Asheville, N. C. claims "without reserve" the discovery that a controlled diet will immunize a person within 24 hours from infection by the dread infantile paralysis virus.

"The doctor said that he and other doctors had learned through experiments started ten years ago that elimination of sugars and starches from the diet will ward off polio.

"Sandler, now a physician at the Oteen Veterans Hospital here, released the information about his reported discovery during the height of a record-breaking polio epidemic that to date has struck 1,172 persons in North Carolina.

"Sandler said:

"'I am talking about this discovery now because I think the polio crisis requires immediate release of all our research findings.'"

It is interesting to note that polio comes in the summer when children are eating large quantities daily of ice-cream cones and highly sugared soft drinks. I think there is a great deal to Dr. Sandler's theory and will discuss it more in detail in an entire chapter for this series which I am preparing on poliomyelitis. The situation is further endangered for children by the use of certain synthetic products made from coal tar derivatives for coloring candies and for use in ice-creams and sodas.

ANTISEPTICS USED IN SUGAR MAKING PROCESS

I went to a sugar refinery in Philadelphia, a few months ago to see the process of making sugar and to learn whether any harmful chemicals are used in it. I have often read that sulphuric acid was used in its manufacture somewhere. I found only one place that I could question but it is a serious question. The sugar goes through the plant in the various parts of the process in liquid form and in one place it goes through filters made of blanketing material. Ever so often these blankets have to be cleaned and a disinfectant is used to kill disease or other organisms. A disinfectant, to kill bacteria, must be a poison, and even though the blankets are then washed out, I believe that some residue of the poison remains to get into the sugar. However slight this may be, it adds to other poisons used in factory processes with other foods so that the

sum total, the accumulation of a varied daily intake of foods that are processed in factories, involves real danger. I found no evidence of sulphuric acid used as a bleach or for any other purpose, but that does not mean that it may not be used in refineries in other states.

CHEAP GLUCOSE

Many of the sweetened products such as candies, soft drinks, cakes, pies, ice-cream, canned fruit, etc. are sweetened by glucose because it is half the cost of cane sugar and it makes a clearer looking candy. Glucose is made by applying sulphuric acid upon starch. Knowing what we do, from our previous discussions of Green's theory of sulphur, this adds another important count against the commercialized sugared products. As I have said before the State of Pennsylvania does not permit the use of sulphuric acid in the manufacture of glucose but other states do. Dr. Harvey Wiley, the first head of the Federal Food and Drug Administration, did everything in his power to draw attention to the danger of using glucose, but all he received for his pains was a dismissal from the department. In 1912 Doctors Lukens and Dohan of the University of Pennsylvania discovered that mice fed on glucose became diabetic whereas the same amount of cane sugar did not cause it.

PRIMITIVE RACES

Medical explorers have noted the wonderful health and teeth of savages who do not have access to sugar, but when they begin to consume the white man's sugar they become susceptible to cavities in the teeth, appendicitis, cancer, etc. Let me quote from the Belding paper above-mentioned:

"Human experience has shown that many races have subsisted upon a diet high in carbohydrates drawn from many sources yet have remained caries free. The native Hawaiians subsist upon a diet high in carbohydrates, yet they have excellent teeth. The early Pacific Islanders, before they died off as a result of contact with civilization, secured a large part of their total caloric intake from carbohydrates, yet they had practically no decay. Likewise, it has been established that through a century the European colonists in Tristan da Cunha, and their descendants, subsisting on a high potato diet have remained almost caries free. In Tristan da Cunha, where until recently there was no bread or other cereal and the main food was milk, mutton, fish, eggs, and potatoes, there was no rheumatism or arthritis, and the teeth were relatively free from caries. In recent years, well meaning people have been sending flour and sugar to the island and as might be expected, the first curse of civilized communities, dental caries, is increasing among their children. Incidentally, their physical status is much better than that of their European brethren and during the last hundred years there has been neither an operation for appendicitis nor a death from peritonitis."

There is a sad picture in the December, 1949 issue of the *National Geographic Magazine,* on page 754. It shows a woman missionary handing out candy to forty-odd children in a primitive region of northern Australia. In the remainder of the article you see pictures of natives displaying wonderful teeth and you wonder what is going to happen to them under a diet of candy and white flour. This is a poor form of Christianity. Missionaries should study the facts brought to light by medical explorers such as Dr. Weston A. Price and others which show that it would be best *not* to bring to the natives of these far-off places the devitalized white flours and sugars of civilization.

In my book *The Healthy Hunzas* it was demonstrated that this race of people who live in the northern part of India were one of the healthiest people in the world. They get no cancer and live long. They eat no white refined sugar. There is no question that their health is due to their marvelous proficiency in the application of the theory of soil fertility, using of course, no chemical fertilizers, but seeing to it that every bit of organic matter at their disposal is put back in the soil. They do not burn manure for fuel as is done by neighboring tribes. Last summer Dr. John Clark of the Central Asiatic Research Foundation of Pittsburgh visited them and in a newspaper account of his observations he said, "What the Hunzas really need are a few new agricultural methods and a couple of small home industries. They haven't any sugar for instance." I will go no further. Dr. Clark is a geologist but should study the organic method of farming and its use by the Hunzas before he advises the use of chemical fertilizers. However, I have been in correspondence with the ruler of Hunza who assured me that over his dead body would any chemical fertilizer ever be used on their soils.

J. I. RODALE.

(To be continued. Part C on sugar in next issue.)

PESTICIDES AND FOODS

HEARINGS are now being held in Washington, D. C. under the auspices of the Federal Food and Drug Administration on the effects of poisonous sprays on the public health. Organic Gardening has been promised a place on the schedule of the hearings to make contributions on this subject. The editorial staff invite readers of this magazine to send to us, for use in these hearings, any information and data you may have on the successful growing of fruits, vegetables, and other foods without the use of poison sprays. It is our hope that all orchardists who are now growing fruits without poisonous sprays will give to us a full report of their practices and results. We shall appreciate early replies so that they may be studied and prepared for presentation at the hearings in Washington.

GARDEN CALENDAR for APRIL

by WILLIAM H. EYSTER, Ph.D.

THE NORTH

April is the month of reawakening of the gardens in the north. The perennials which spent the winter under ground and winter mulch are sending forth aerial stems for a new season's growth. As soon as the soil becomes sufficiently warm, the seeds of annuals which have been dormant in the soil during the winter will germinate and grow up into the April sunshine. The soil should be the gardener's first consideration in April. Remove winter mulches cautiously and gradually from perennial beds and borders, leaving the finer parts of the mulches as food for the soil organisms.

If the soil has been well mulched, it may need little or no digging. It may be well to work a little compost into the upper one or two inches of the soil. But do not work in the soil when it is too wet. To insure good seed germination, put a small amount of compost in the row trench and cover the seeds with a sprinkling of finely screened compost.

Flower Garden:—Give the perennial beds a good top dressing of compost to conserve moisture, control weeds, and enrich the soil. Divide and replant such perennials as delphinium, helenium, anemone, japonica, fall asters, ceratostigma, Shasta daisy, azaleamum, and chrysanthemum for vigorous growth and good blooms. Phlox and Michaelmas daisy should be divided, but only the outer ring should be used for the propagation of new plants.

As soon as the weather has settled, set out from the coldframes pansy, forget-me-not, Canterbury bell, aquilegia, foxglove, boltonia, Japanese lantern, and others. Such rampant growers as achillea, goldenglow, boltonia, Japanese lantern, and sedum should be weeded out to make room for new growth. You need not be too careful as it is impossible to eliminate them completely from the perennial bed.

Gladiolus plantings should begin late in April and be repeated at two week intervals until well into the summer. This will insure a continuous supply of these beautiful flowers. Give the iris plants a dressing of compost. Plant seeds of the annual hollyhocks now for August blooms. Petunia may be sown outdoors after the soil has been well raked and enriched with screened compost. It may be well to cover the seed bed with wet burlap to prevent the seeds from being washed out by spring rains. The burlap must be removed at the first signs of seedlings, otherwise the seedlings will elongate and be worthless. House-grown seedlings of annuals should be exposed to the April air and sunshine to harden. Pinch back any plants which seem to have weak, leggy stems. Sweet peas should have been planted in March, but may still be planted now.

This is the best time to plant the golden-banded lily of Japan, the regal lily, the speciosum lily, the Formosa lily, Henry's lily, and other lilies of this general class. Early irises may be dug and planted inside for early spring blooms. Cuttings of house plants as wandering jew, coleus, and others should be made now for setting out in beds later. There is still time to start dwarf dahlia, but the seeds should be sown indoors or in coldframes.

If pinched back, perennial phlox will give a long succession of flowers. Oriental poppies die down rather early and leave an ugly open space in the border. Such spaces can be closed by planting scarlet sage or hyacinthus.

The Lawn:—The lawn should be given a good coating of finely screened compost. Rake the bare spots with a steel rake and reseed them. By feeding the lawn now so that the lawn grasses make a rapid growth, you will not be bothered with crab grass later. Fill the low spots with good soil and seed. If the fill is not too deep, the lawn grasses will grow up through the fill. Bone meal may also be added to the lawn.

Vegetable Garden:—It is time to sow the seeds and set out plants of the more hardy vegetables. Among others, plant asparagus, spinach, kohlrabi, onion seed, early cabbage, early celery, herbs, lettuce, parsnips, parsley, early peas, early potatoes, radishes, endive, Swiss chard, turnips, horseradish, beets, broccoli, Brussels sprouts; and tomatoes under glass. Late in April, sow pole beans. For earlier than usual vegetables, use hotcaps, glass gallon jugs as described on page 20 in the March, 1949 issue of this magazine or cloches (*Organic Gardening*, March, 1950, page 45).

THE WEST

Flower Garden:—As soon as you see volunteer plants of any kind in the garden you may be sure that it is safe to plant the seeds of such plants. If you see a volunteer marigold, for instance, it is safe to set out in the border or bed marigold seed-

lings that you may have started indoors. Self sown seedlings are apt to be strong and are valuable plants providing you are sure of the variety to which they belong.

Set out chrysanthemums now. Sprout dahlia roots before putting them in the soil, or you can sprout them and transfer the rooted shoots to the garden. In this way many plants may be obtained from a single root. Transplant into the garden zinnias, marigolds, asters, petunias, and other half-hardy plants. Keep the gladiolus well watered and make repeated plantings for continuous bloom during the summer and fall. Transplant Transvaal daisies. Plants which do not like to be transplanted are nasturtium, portulaca, salpiglossis, mignonette, California poppy, and zinnia.

Summer bulbs should be planted late in April. In the Pacific Northwest, April is the month for snowdrops, scilla, crocus, winter aconite, puschkinias, and chionodoxas. Set out pyrethrums. Make cuttings of pentstemon, and separate the pampasgrass.

Vegetable Garden:—See suggestions for the North. Vegetables are classed as ultra-hardy, hardy, semi-hardy, tender, and very tender. All but the tender may be planted in April.

THE SOUTH

Flower Garden:—Prune spring-flowering shrubs and climbing roses which bloom only once a year *immediately after they have finished blooming.* Divide and reset chrysanthemums, and other perennials.

Seeds that may still be sown are sweet alyssum, four o'clock, moonflower, periwinkle, portulaca, sunflower, ageratum, marigold, torenia, petunia, cosmos, zinnia, and balsam.

Set out into the garden such heat-loving plants as gaillardia, zinnia, portulaca, ageratum, physostegia, and wishbone flower. For tropical backgrounds, plant in moist shady places bananas, elephants-ear, castor bean, canna, caladium, acalypha, coleus, ginger lily, and ricepaper plant. For dry sunny places, use bamboo, yucca, agave, Chinese hibiscus, lantana, cestrum, clerodendron, and the pampas and other grasses. The ice-plant is recommended as a ground cover.

THE LOWER SOUTH*

Flower Garden:—To make roses bloom in Florida throughout the summer, says Horticulturist Blackmon, of the State Experiment Station, they should be fertilized and given proper attention at the beginning of the season. Diseases and insects, he reminds his readers, give roses more trouble during hot weather than at other seasons. He suggests sprinkling 2 tablespoonfuls of good garden fertilizer around each plant. Those who are using compost instead of the regular commercial fertilizer will need to apply more than the above amount; two inches of compost, worked into the soil, would be none too much. Seeds and plants for April are: aster, scarlet runner bean, cosmos, dahlia, Shasta daisy, gaillardia, globe amaranth, ornamental gourd, ornamental sunflower, marigold, morning glory, petunia, portulaca, salvia, tithonia, verbena, periwinkle, zinnia.

Vegetable Garden:—Plant bush, pole and lima beans, beets, cabbage, cantaloupes, carrots, collard, corn, sweet and roasting ear, cucumbers, egg-plant, kale, kohlrabi, lettuce, mustard, okra, potatoes, pumpkin, radish, roselle, spinach, squash, swiss chard, tomatoes, turnips, watermelons. When planting sweet corn, try the experiment of planting soy beans as a companion crop. Some months ago there appeared in this magazine an article by Dr. Eyster on the growing of sweet corn, with illustrations showing the greater and more vigorous growth of the corn when grown with soy beans. It was also noted that this practice builds up the soil. Another experiment, which the writer expects to try, is that of going back to the original golden bantam corn instead of the various hybrids so popular of late. Though the latter may have a slightly greater resistance to worms, on account of the tighter husk, there is a decided lack of the finer quality of the real golden bantam. With plenty of compost in the soil, the old and tried varieties should make a better showing than with commercial fertilizers only. A good variety for late planting is the black Mexican.

Trees and Shrubs:—Where one has sufficient space, it is worth while to plant citrus seeds for raising young trees to be either budded at the proper time, or to grow to maturity. Seedling grapefruit grow considerably larger than the nursery budded stock, and have many seeds, but a good tree of this kind has larger fruit, and often of a finer flavor than the other. In small gardens the nursery trees will be most appropriate. Two-year buds on a five-year root often bear within one or two years and produce a satisfactory crop without taking up a great deal of room. For nursery stock, plant rough lemon and sour orange seeds. You will then have suitable root stock for either muck or sand.

THE SOUTHWEST**

April is a midseason month of the gardens in the Southwest. As the weather warms up we finish the plantings commenced in March. While the moisture is still in the soil, make every preparation to conserve it by composting and mulching. The spring season with its abundance of green material is an ideal

* Edwin H. Abrams, St. Cloud, Florida

** Charlotte M. Hoak, 1125 Stratford Ave., South Pasadena, California

time for making compost; weeds, lawn clippings, Bermuda rakings, green vegetable waste from markets, etc., should be returned to the soil. Our best vegetable activator for this region is Humisite which may be used as thin layers in your compost pile, and in all your planting soil mixtures. By the first of April all cover crops and sheet-compost should be spaded in and ready for summer planting.

Flowers:—Summer-flowering bulbs, tubers and rhizomes are particularly suited to our area and drought. Plant at this time billbergias, callas, cannas, chioanthus, cooperia, crinum, dahlias, dieramas, dietes, hemerocallis, liriope, nerines, moreaes, tigridias, tritonias (Earlham hybrids), tuberoses (single and double), tulbaghias, waterlilies, and zephyranthes. Plant liberally such long-lasting evergreen material as agapanthus, *Amocrinum Howardi*, clivias and kniphofias. Feed generously the deciduous bulbs which have passed out of bloom until the leaves have turned brown if you want good blooms next season.

Sow thinly and thin to the strongest plants such annuals as cleome, cosmos of all types, annual gaillardias, gypsophila, marigolds both African and French, moonvine, morning glory, portulaca, salpiglossis, double and single sunflowers, scabiosa, tithonia, and zinnias. Nasturtiums both double and single, climbing and dwarf bloom the entire season luxuriantly if sown where they are to bloom. If you have not raised your own, your local nurseries are offering a wide range of well-grown plants for immediate planting. You can set out such annuals, as aster, ageratum, semperflorens begonias, didiscus, and annual phlox, new types. Seasonable plantings of many perennials are in order. Select the best types of Pacific Hybrid delphinium, blue, white, and yellow marguerites, zonal geraniums, Martha Washington geraniums, pentstemons, physostegias, perennial phlox, salvia Blue Bedder, purple or Mexican sage, scarlet sage, stokesia and Transvaal daisies. Continue making cuttings of chrysanthemums, dahlias, geraniums, fibrous-rooted begonias and poinsettias, double and single. Mulch heavily all fuchsias to stimulate the new blooming wood. Keep seed-pod off of sweet peas, pansies and violas, and they will continue blooming until midsummer. If you have planted the tetra-snapdragons, you will find that they too respond to such care and are not prone to rust early in the season.

Trees and Shrubs:—By April it is safe to plant the tender tropicals and subtropicals. Avoid putting them in key positions. Do not try to nurse old hibiscus back to life. Pull out half-dead stumps and plant vigorous young specimens. Use more of the frost-resistant vines and shrubs, both native and exotic. A day spent in a large nursery will materially aid you in selecting the best material. Plants tell their own story. While we can plant almost continuously in our southwestern gardens, fall and winter-planted stocks establish themselves better and make more growth than those put in after the long dry season sets in. Balled avocados and citrus trees can be set. Select the varieties best suited to your locality. Early blooming deciduous trees and shrubs can be pruned and shaped up at this time. Consult R. Sanford Martins book on pruning. Avoid the beauty-destructive Japanese bobs given by some of your gardeners. Be careful to basin and mulch. See that stakes are properly set and protect trunks from sunburn. Feed your azaleas and camellias with leaf mold and compost regularly from now on and be sure they do not dry out at any time. Do not cultivate around your camellias, as they are shallow rooters; and avoid the use of ordinary peat as it is either too wet or too dry. Fine camellias have been grown in California without the use of commercial fertilizers. Use leaf mold and acid compost instead.

Vegetables:—Observe succession with your hardy vegetables. Keep up this side, and you will have a wider variety when your warm weather vegetables commence to come on. At this season plant seed of corn, cucumber, okra, kohlrabi, summer squash and bush and pole beans. The Armenian Cucumber, Hirta, is hardier, and a more prolific bearer than the ordinary one, and can always be eaten peeling and all. All around, it is the best climbing cucumber for our region. Try planting eggplant, peppers and tomatoes, using hot caps to get them started. Thin to the strongest plant. Prepare the soil two to three feet deep before planting. Turnips are better and tough in hot weather. Use kohlrabi as a substitute. The dark green and rich yellow summer squashes are richer in vitamin than the much-used white pattypans or scallops. Sow tampala the last of the month as a substitute for spinach; and keep the perennial New Zealand spinach growing summer and winter. You can use it to knit an embankment. Dandelion and French sorrel grow without care. Most leaf lettuces, Bibb, Oak Leaf and Black-seeded Simpson do well in summer. If you want a head lettuce, try Slowbolt. Onions from seeds, seedlings and sets never should be absent from your gardens. Leaf garlic is an ornament to your bulb border, and lends just the right flavor to your green salad bowl. Chives and parsley, too, make an excellent edging to flower borders. Rhubarb chard is quite as ornamental as cockscombs. See that your herb bed is well set up for the summer. Cut out salt and pepper, and use instead the "good herbs" to savor your cooking. By all means, sow seeds of giant sunflowers and sesame, and learn the nutritional value of vitamins E and F. Both are very easy to grow. If you have room, sweet potatoes and yams are easy to grow. Establish a small salad garden if you possibly can. A space 10′ x 12′ will raise a large amount for your salads. Do not hurry to rush in lima beans and beefsteak tomatoes until the hot weather. If you want a showy quick-growing hedge plant and jelly, also, use a row of Roselle or New Zealand Jelly plant, as a division line between your vegetables and flowers.

HINTS for the FLOWER GARDEN

CURING TUBEROUS BEGONIAS

As tuberous begonias, in pots, begin to have yellow leaves, taper off on the water. Eventually the stalks will break off clean. If in the ground, take them up with a clump of earth before this and set in flats to ripen. After curing, store where you can sprinkle now and then during dry spells to keep the tubers firm. They are less apt to freeze, and start earlier this way.

—o—

VINES FOR SPECIAL PURPOSES

Flowering Vines: Various bignonias, tecomas, bougainvilleas, jasmines, honeysuckles, and many others.

For covering brick or masonry: Boston and English ivy, Bignonia tweediana, creeping fig, climbing euonymous.

High Climbers: Bignonia cherere and tweediana, the bougainvilleas, wisteria, Solanum wendlandi, and the cup of gold.

Quick Growing Annuals: Gourd, Moon Vine, Morning Glory, Scarlet runner bean, cup and saucer vine.

—o—

PLANTING IN POTS

Wet your flower pots before planting in them. See that there is a layer of coarse gravel or pieces of broken pots in the bottom for drainage. If you have no pots or gravel, the coarse sand or even moss is better than nothing at all. Flower pots buried half way or fully buried in sand or soil will not dry out so much as the unburied pots.

—o—

WILD VIOLETS

If you find it difficult to grow plants along the north side of the house or in the shade of trees or shrubs, you may find it a lot of fun at no expense to start a collection of native wild violets. There are many variations in color and size of the common purple variety growing in wooded areas and fields around the countryside.

—o—

LILACS

If your lilacs do not bloom it may not be lack of pollination as quite a few gardeners often believe. Shade, competition of tree roots, poor drainage, insufficient organic matter in the soil or heavy infestation of oyster-shell scale insects may be the cause of nonblooming.

—o—

DO YOU KNOW?

Although the scented-leaved Geraniums are known mostly as Rose Geraniums, the scented leaves of various species and varieties include the scents of rose, lemon, fruit, mint, spice, apricot, lime, strawberry, nutmeg, ginger, cocoanut, apple, pine, and almond.

—o—

TIME TO PLACE OUTDOORS

When plants growing indoors in seed flats seem to stand still, they should be placed outdoors in a cold-frame for more light and cooler temperatures.

—o—

CUTTINGS FOR THE GARDEN

There is still time to take cuttings of house plants to be planted in the garden later on. Coleus, begonias, impatiens and others root in a glass baking dish of sand or vermiculite. After they have roots a half inch long, pot up in another glass dish filled with a mixture of equal parts of soil, sand and peat moss. You can plant right out of this to the garden.

FLOWER ARRANGEMENTS

Standard laboratory test tubes can be used for displaying specimen blooms. The test tubes which are inexpensive and easily secured are fitted into small wooden blocks drilled to take them. The blocks can be of various shapes and the drilled holes at various angles, to give the flower arrangement the desired effect. This method lends itself nicely to a large degree of originality. The blocks may be painted or stained. Such arrangements make the flowers the center of attraction.

—o—

WEIGELA

Weigela is a fine looking shrub in those sections where it is hardy enough to grow. New hybrids of this plant such as Bristol Ruby and Othello, are in many ways better than the old types. These new ones have better habits of growth and lovelier colored flowers than the older ones.

—o—

HARDY HIBISCUS

Cut off the tip buds of your hardy hibiscus (mallows) when they are about a foot high. This will make them bloom about two weeks later, but will make them flower much more profusely.

—o—

FEEDING BULB FLOWERS

Gardeners often neglect to feed fall planted, spring-flowering bulbs as the blooms mature. Feeding at this period of the year insures growth of the mother bulb and bulblets for maximum growth and flowers next year. A gardener should not only consider the blooms he will get this year, but should always look ahead to next year as well.

SEMINAR — WEEDS

WEEDS AS INDICATORS OF SOIL ACIDITY

Q. What weeds may be regarded as indicators of an acid soil?

A. Some common plants which grow only in acid soils are *Spergula arvensis,* commonly known as corn spurrey, low star grass (*Poa annua*), sheep sorrel (*Rumex acetocella*), cinquefoil, swamp horsetail, hawkweed and knapweed. All members of the Heath Family including rhododendrons, azaleas, blueberry, arbutus, and most other shrubs living in our woodlands require an acid soil.

Q. What weeds indicate only a slightly acid soil?

A. Typical weeds which grow in a soil that is slightly acid usually as a result of insufficient aeration are daisy, horsetail, field sorrel, and doorstep weed.

Q. What weeds may be regarded as indicators of "alkali" soils?

A. Weeds which are largely confined to "alkali" soils include tussock grass (*Sporobolus airoides*), salt grass (*Distichlis spicata*), fine-top salt grass (*Sporobolus asperifolius*), pickleweed (*Allenrolfea occidentalis*), saltbushes (*Atriplex* sps.), kochia (*Kochia californica*), saltwort (*Suaeda suffrutescens* and *S. torreyana*), samphire (*Salicornia* sps.), sesuvium (*Sesuvium portulacastrum*), spurry (*Spergularia* sp.), nitrophila (*Nitrophila portulacastrum*), alkali heath (*Frankenia grandifolia*), yerba mansa (*Anemopsis californica*), common spikeweed (*Centromadia pungens*), and bushy goldenrod (*Bigelovia veneta*).

Q. What weeds may be regarded as indicators that "alkalis" are not present?

A. Weeds which are intolerant of alkalis are the common sunflower (*Helianthus annuus*), common sow thistle (*Sonchus oleraceus*), cheese weed (*Malva parviflora*), annual yellow sweet clover (*Melilotus indica*), common plantain (*Plantago major*), Bermuda grass (*Cynodon dactylon*), and horseweed (*Erigeron canadensis*).

Q. Can weeds on "alkali" or other soils be checked by changing the soil reaction?

A. Yes. Hartwell and Damon (1917), in their study in Rhode Island, of lawn and other grasses as

WILD CARROT

influenced especially by the degree of so-called "soil-acidity" or "soil-alkalinity", found that dandelions and plantains are checked by increasing the degree of soil acidity.

WEEDS AS INDICATORS OF SOIL TYPE

Q. What do wild mustards indicate as to soil condition?

A. One-sided fertilizer application, particularly an excess of potassium, is accompanied by the wild mustard and related weeds of the Cruciferae family.

Q. What weeds occur most commonly on sandy soils?

A. The weeds which indicate that the soil is sandy are most goldenrods, many-flowered aster, arrow leaved wild lettuce, yellow toadflax, onions, partridge pea, and broom bush.

Q. What weeds occur most commonly on limestone soils?

A. The most common weeds on limestone soils are penny cress, field peppergrass, wormseed, Canada blue grass, Cornelian cherry, Barnaby's thistle, field madder, mountain bluet, and yellow camomile.

Q. Which weeds are indicators of an abundance of potassium in the soil?

A. Potassium indicators are marsh mallow, knapwood, fumatory, opium poppy. Clover is also a good indicator of potassium in the soil.

Q. Which weeds are indicators of poorly drained soils?

A. Indicators of poorly drained soils are smartweed, hedge bindweed, silverweed, white avens, swamp horsetail, meadow pink, hedge nettle, stinking willie, Canada and narrow-leaved goldenrod, tradescantia, purple stemmed aster, Joe-Pye weed, March foxtail, rice cut grass, and many of the sedges.

Q. Which weeds, if any, indicate the presence of hardpans in the soil?

A. Indicators of an encrusted soil and/or hardpans in the soil are field mustard, horse nettle, penny cress, morning glory, quack grass, the camomiles, and pine-apple weed.

Q. How long do weed seeds remain alive in the soil?

A. The seeds of some weeds may remain dormant in the soil for many years. For instance, 68 percent of the seeds of the smooth mullein (*Verbascum blattaria*) germinated after being buried in the soil for 60 years.

Q. How much heat is required to kill weed seeds?

A. The seeds of many weeds can remain viable in temperatures up to 176 degrees F., while a few can withstand the temperature of boiling water.

Q. Are the temperatures in the compost heap sufficiently high to kill all weed seeds?

A. No. Some are killed by the existing temperature, but others are induced to sprout and are subsequently killed by the drying out of the heap.

CONTROL OF WEEDS

Q. Is pulling the weeds an effective method of control?

A. Hand pulling of weeds is a practical and efficient method of eliminating weeds in home gardens and within the rows and hills of certain cultivated plants. It is more effective with annuals and biennials than with perennials.

Q. What is the best method for removing weeds from the lawn?

A. In lawns, especially new ones, pulling is an effective method of eradication of certain weeds. This is best done when the soil has been soaked with water, for then weeds may be readily removed without breaking their roots.

Q. Is tillage an effective method of controlling weeds?

A. The principal purpose of tillage is to destroy weeds. In the case of annuals, tillage methods must destroy the top only. In dealing with biennials both top and root must be destroyed. In perennials top, root, and underground stems must be destroyed. Tillage reduces potential weed growth by encouraging the germination of weed seeds in the soil.

Q. What is meant by controlling weeds by blind tillage?

A. By blind tillage is meant the tillage of the soil after seeding a crop, either before the crop plants are up or while they are in the early stages of growth. This is a common practice in controlling weeds in corn fields. After the kernels have germinated and anchored themselves in the soil the corn ground is tilled with a spike-tooth harrow or a special weeder. This may be repeated until the young plants are from 4 to 6 inches tall. Tillage must be done when the soil and plants are dry and least brittle, as in the afternoon of bright warm days.

Q. Is mowing an effective method of weed control?

A. Yes, but the mowing must always be done before any of the weeds go to seed. Mowing may be used to prevent seeding of all classes of weeds. Such weeds may be used for making compost and for mulching the soil without danger of spreading obnoxious weeds.

Q. What is the simplest and most practical method of controlling weeds?

A. The method to be used will vary with the weeds and the soil in which they are growing. However, the simplest and doubtless the most practical method of controlling weeds is a suitable mulch. Mulching materials include stones, straw, hay, sawdust, peat, shredded leaves and bark, peanut shells, almond shells, cotton hulls, etc. In any case the mulch must be placed on the soil thick enough to prevent the growth of the weeds in question. A new, effective mulch in weed control consists of a paste made by disintegrating plant materials in water and adding the paste on the soil where it forms a continuous, porous layer of such thickness as is necessary to prevent weed growth.

MEADOW BUTTERCUP

Q. Can weeds be controlled by smother crops?

A. Yes. One of the best ways to eliminate quack grass from a lawn is to so enrich the soil that the lawn grasses will grow so vigorously that the weed will be crowded out. Many farm weeds are eliminated by planting weed-infested fields with smother crops.

Q. What are some of the more important "smother crops"?

A. The principal competitive crops valued in weed control are millet, Sudan grass, sweet clover, sunflower, rape, barley, rye, sorghum, buckwheat, soybeans, alfalfa, cowpeas, clovers, hemp, Jerusalem artichoke, and ensilage corn.

Q. Do you recommend the use of chemicals to kill weeds?

A. No. Chemicals which kill weeds are apt also to kill the beneficial organisms in the soil.

Q. Would it be a good practice to eliminate all weeds by the use of suitable and effective herbicides?

A. Absolutely not. Weeds are of tremendous importance to the soil and to the farmer and gardener. Weeds have much to tell those who know how to interpret them.

Q. In what respects are weeds beneficial?

A. Farmers and gardeners often grow a clean cultivated crop, but abandon the land as soon as the crop is harvested, leaving the soil naked and unprotected. Such soil is subject to erosion by wind and running water. However, weeds quickly occupy such abandoned garden plots and fields and effectively conserve

the soil. Also they absorb minerals from deep soil layers and deposit them on the surface where they are needed in the nutrition of crop plants.

Q. Does the rotation of crops facilitate the control of weeds?

A. Yes. Many weeds thrive best and cause the most trouble when the same crop is grown year after year. Farm weeds may be arranged in four groups: (1) weeds of cultivated crops, (2) weeds of grain fields, (3) weeds of grasslands and meadows, and (4) weeds of pastures.

One of the most effective methods of controlling weeds is to increase the humus in the soil. This makes it easy to pull weeds which do grow and the humus seems to make the soil unsuitable for many of the most obnoxious weeds.

CONTROL OF SOME TROUBLESOME WEEDS

Q. How may Bermuda grass be controlled?

A. The best known method of eliminating Bermuda grass is to plow or dig the soil in late autumn so as to expose the rootstocks of the plants to the air over winter. Of course, this method depends upon the existing winter temperature. In Virginia, where frosts are less severe, exposing the rootstocks over winter may not destroy them. In this case the soil should be plowed in September and sowed in a winter smother crop such as rye, barley, or oats. As soon as the crop is removed, the field should then be plowed again or thoroughly disced and planted with a crop of cowpeas or velvet beans. The dense shade of two successive covercrops will destroy most of the Bermuda grass and leave the soil fit for a cultivated crop.

Q. What method of control do you recommend for bindweed or morning glory?

A. The most effective method of controlling these large-rooted weeds is to keep the field in continuous clean cultivation until the plants

NARROW-LEAVED PLANTAIN

have been killed. The cultivation should be repeated at regular intervals so that little or no top growth can take place. There is no advantage in working the soil when these plants are dormant. The purpose of the cultivation is to prevent top growth and thus eventually kill the roots underground. If the tillage is started immediately after small grain harvest, eradication may be completed by the end of the following season. Difficult weeds such as morning glory, thistle, quack and other grasses may be controlled by covering the entire surface of the field with a smother mulch made of organic matter and waste paper. For making such a mulch, a machine, the Agromulch, is now available.

Q. What is the easiest method to control cocklebur?

A. Cocklebur can be controlled by clean cultivation, followed by hand hoeing and weeding. All waste places should be kept mowed before fruits are formed. Mature plants should be composted before being used to enrich the soil.

Q. What is the best way to eliminate quack grass?

A. This is a difficult weed to control because it produces so many underground stems, each joint of which is capable of growing into a new plant. Cutting up a plant with a cultivator or hoe is in effect propagating the plant asexually. All rootstocks which are hoed or pulled out should be composted in a compost heap. By persistent and continuous hoeing and pulling, quack grass can be kept under control. Of course, it can be smothered with a smother mulch, as indicated above for morning glory.

Quack grass cannot stand crowding by other plants and shade. It can be crowded out of lawns by feeding the lawn grasses early in spring so that the grasses will grow with such vigor that the quack grass and other weeds will be crowded out.

Q. What suggestions have you for controlling Johnson grass?

A. The most important measure in the control of Johnson grass is to prevent it from seeding. This can be accomplished by cultivation, mowing or hand cutting, or mulching. Care must be taken in cultivation that it is not spread to new areas. Elimination is accomplished best in dry weather. Eradication by digging is a feasible method in light soils.

Q. I should like some information about the control of wild garlic.

A. Garlic produces aerial bulbs on the top, also sometimes true seeds. At the same time it produces new bulbs alongside the old ones in the ground. The old bulb dies after going to seed, but late in the summer both the aerial bulbs and those produced underground begin to grow. Most of them can be killed before they form new side bulbs by plowing them under cleanly in early winter. This plowing should be done in November or later. Some bulbs will escape a single plowing, so that two winter plowings with a cultivated crop between are usually sufficient to more or less completely eliminate wild garlic.

Q. How can I get rid of purslane?

A. Purslane thrives best in an acid soil and may be an indication

(*Continued on page* 58)

MISCELLANY . . .

(*Continued from page* 20)

SALT AND MIGRAINE

In the book *Mind and Body,* Psychosomatic Medicine by Dr. Flanders Dunbar, (Random House) appears the statement:

"Migraine is only one type of headache, although a common one. It and others are attributed to various physical disturbances. Dr. Max Goldzieber attributes them to pressure inside the cranium caused by an increased flow of water to the tiny blood vessels of this area because of an abnormal retention of salt in the tissues. He was very successful in treating these cases with medication which removed the excess salt, and decreased the irritability of the walls of the blood vessels, and by recommending a salt-free diet."

This adds another condition to those mentioned in the February issue on salt as a cause of cancer.

J. I. RODALE

HASTEN COMPOST MATURITY

use YEAST BIORG **Nature's Miracle PLANTFOOD**

and ENZYME ACTIVATOR

That's right, YEAST. Ever since life came to this Earth this miracle fungus did practically all the world's ACTIVATING. It rotted wood, decayed leaves, soured grapes and 'activated' hops, barley and dough. Concentrated into a powerful dried energy yeast, it is now "HARNESSED" for you to use as

One of the World's Highest
NITROGEN ORGANICS

Because of its concentration (50% Protein) it can be diluted 10 or 20 times. This makes it inexpensive enough to compete with cheap but high freight chemical or low organic fertilizers. We "harnessed" yeast for you into 3 most useful Organic Gardener's aids:

BIORG: the LIVE yeast formula for compost activation. Contains both: Soil *Bacteria* and *Active* Yeast.

SOILORG: the dry yeast formula. A *dilutable* Plant Food. Very high in both *Soluble* and *Slow* Nitrogen.

GROWFAX: the CONCENTRATED worm food fortifier. Use *as is* or fortify *weak* worm foods. Available in generous $1. and $2. sizes. POSTPAID. Quotes in larger sizes or bulk by request. If dealer is out order direct.

SCHIFF BIO-FOODS SOILORG
DEPT OG-4A • JERSEY CITY 3, N.J.

STURDY HARDY PERENNIALS

Strong, well-rooted plants, packed to carry safely coast to coast, and then live, thrive and flower. Hundreds of kinds, unusual bulbs and hardy plants, in our New illustrated Catalog. Ask for your copy.

REX. D. PEARCE
Moorestown Dept. D New Jersey

Hyper-Humus
NATURE'S SOIL BUILDER

NOW in Moisture-Proof Bags—
The Rich Vital Soil Organic
CULTIVATED and ENERGIZED

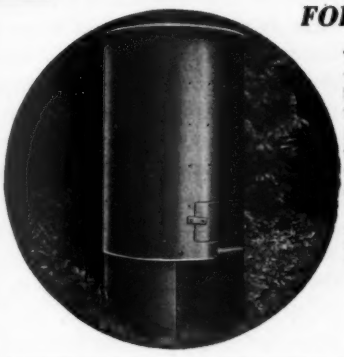
HYPER-HUMUS comes to you in kraft, polyethylene lined 25, 50, 80 and 100 pound bags. These sturdy, moisture-proof, easy-to-handle bags preserve all the life-giving vitality of HYPER-HUMUS for long periods.

HYPER-HUMUS is also now energized for greater efficiency. Depend on it for healthy plant growth and more production. Remember, this is real humus, not peat moss.

Also sold in bulk, see your dealer or write us
No shipments west of Miss. River

HYPER-HUMUS CO. Box 19, NEWTON, N. J.

FOR GARDENING EFFICIENCY



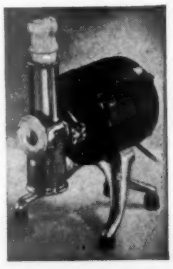
Think of it! Garbage which has always been wasted may now be transformed into velvety black humus—a perpetual source of organic fertilizer for your garden.

Just like a savings account. You add garbage, weeds, dirt, waste matter little by little until you have accumulated a wonderful 100% organic compost—nothing better for your soil. Let The American Composter work for you to produce correctly aerated, finely textured, 100% organic compost. Buy NOW before it's too late. Write today for complete information.

Priced from $40.00

Custom Built Units to Specifications

AMERICAN COMPOSTER CO. **Glen Ridge, New Jersey**



K & K Shredder Juicer

Now AVAILABLE

Immediate delivery, write for details on accepted leadership in home juicers.

KNUTH ENGR. CO. **Dept. G. 2617 N. St. Louis, Chicago, Ill.**

ORGANIC FOOD DIRECTORY

ORGANIC GARDENING *invites all who have organically grown foods for sale to list them in the* Organic Gardening Directory. *There will be no charge for listing your name, address, and organically grown produce in this directory. Write us, telling in detail what you have that is organically grown, mentioning how long and in what manner you have applied the method. Write to*

Organic Food Division
ORGANIC GARDENING, Emmaus, Pa.

VITAMINS PRODUCED IN YOUR KITCHEN
WITH THE IN 3 DAYS **SPROUTMASTER**
Write for free literature—Dealers Wanted
Western Nutrition Laboratories
6 ORANGE STREET, REDLANDS, CALIF.

Clean Chimneys Permanently

Stops down draft—prevents furnace explosions. Satisfaction guaranteed. This copper pot (with character) Mailable. For free booklet address

WIG., ABINGTON, MASS.
SAVES FUEL

WILD FLOWERS

(*Continued from page 21*)

Habitat studied

The plant propagator needs to know the natural habitat, which includes some knowledge of local climate, especially such weather factors as sun and shade, wind and rain, snow or mulch for winter protection, so as to duplicate them where needed; also he must take note of the soil type where plants thrive best. Some plants grow best in woods soil with much vegetable mold, others need muck or peat as substratum. The moisture content, the acidity status, and general soil texture need attention. All these factors bear on success or failure in garden culture. Shady places can be selected or provided, habitat soil can be collected and distributed. Thatched roofs will give any amount of shade, and water can be piped. In fact most all factors of natural habitat can be duplicated in garden culture. The natural condition of ledges or hillsides, can be imitated in the rock garden. Better than normal conditions may sometimes be devised. If improved conditions exist, the increase in number may be hastened, as man can improve on nature. The history of horticulture shows this important fact.

Reproduction noted

It is an asset to the plant propagator or collector to note the common mode of reproduction (such as by seeds, runners, bulbs, division or separation) and hasten it if he can. This is the way to greater abundance of rare plants. Many people can and will purchase rather than collect, for only a limited number of people care to scramble and carry a pack to get their own supply; buying is easier! Artificial reproduction is a new practice. It saves the time of many collectors, which is the same as money; it diminishes the fear of anxious people; and what is more important, it forestalls extinction of scarce species. Laws to preserve the wild flowers may soon become obsolete through disuse. This may lead to much contentment and ease among those who love plants. The annihilation fear will fade away and the extinction idea will recede.

Some requirements

Mayflowers do best in moist shady places; orchids need moisture and shade; ladies' slippers need peat and muck soils that are acid; the fickle sunrose, a rock rose, likes full sun and will resist drought; ferns need shade and protection from drying winds; lily-of-the-valley does best in shade with manure mulch; opuntia, a cactus, grows on dry gravelly ground; moneywort needs shade; anemone needs damp rich soil and partial shade; Indian pipe does best in cool, moist, shady places; yellow-sand-iris grows in hot and dry locations. By noting these and other requirements one may simulate the natural habitat about the house as well as in the nursery. Catalogs and garden books will reinforce one's observations to avert error. Rose plants can be grown at home. In these and other ways the fear of extinction may be indefinitely postponed.

Many of the wild flowers one sees while on a holiday may be grown at home. Domestication is easy. The wealth of blossoming of wild plants is enough to gladden the heart; and these plants can be grown in a corner of the garden and enjoyed at any time without a trip to the country-side. If unable to collect for himself, one may order from a nursery specializing in wild plants.

GIFTS FOR THE HARD TO PLEASE

Quaint Personalized Marriage and Anniversary Plates with bride and groom names baked in. Donors name and congratulatory message inscribed free. Decorated with vivid blue and rust Penna. Dutch Floral Design on cream plate. Size 10½".
PRICE $12.00 postpd.

• Salt and Pepper Shakers. Hand decorated with Penna. Dutch Floral Designs similar to above. Excellent for bric-a-brac. 4" high.
PRICE $2.00 pair, postpaid.

Sorry no catalog. Allow two weeks for delivery.

Melvin G. Kleppinger
Ceramics
P. O. Box 212 Emmaus, Penna.

E-Z-GARDS
PROTECT YOUR EVERGREENS, SHRUBBERY, FLOWERS AND LAWN
Ornamental design adds to beauty of yard or garden.
Self-Supporting—No Stakes or Posts!
Easy to set up and just as easy to remove.
WRITE US FOR LITERATURE, PRICE AND NAME OF NEAREST DEALER.
BROADWAY MACHINE & MANUFACTURING CO.
Dept. O SHELBYVILLE, INDIANA

You'll like

THE ORGANIC FARMER

Its wide coverage on all phases of farming makes it an ideal magazine for the owner, or potential owner, of any size farm.

Join our thousands of enthusiastic subscribers, people who claim:

"I know of no other periodical, no other subject, so utterly stimulating and fascinating."
BETH ST. CLAIR, Galt, Ontario.

"I have received my first issues of *The Organic Farmer* and I am very glad that I subscribed. I believe it is one of the best farm magazines."
J. C. ANSELL, Jennerstown, Pa.

One Year, $3 ***Two Years, $5*** ***Three Years, $6***

Write today! **THE ORGANIC FARMER, Dept. 4-G, Emmaus, Pa.**

American Garden Enthusiasts are Reading . . . Britain's lavishly illustrated monthly, GARDENING ILLUSTRATED. Highly valued by American gardeners for its unique coverage of world horticulture and its delightful sections on old-world English gardens. Leading plantsmen contribute regularly, specialised features on new and uncommon plants, detailed reviews of latest British and European varieties, etc.

Join our ever increasing number of American Subscribers TO-DAY! CLIP AND MAIL

Send only $1.50 made payable to our authorised agent, Jeremy North—Bookseller (Gl. 154), "Friendship House," Jamestown, Rhode Island, with this coupon completed, for 12 consecutive issues sent direct to your address from London. Two Years $2.75. Three Years $4.

Name .....
Address .....
.....
City ..... State .....

THE
Salt-Free Diet
COOK BOOK
By E.G. CONASON, M.D., and ELLA METZ, Dietician

▶ 150 delicious, basic meals that make the Salt-Free Diet a pleasure to follow, and comply with all medical specifications. 60 meals for reducing. Special diets for diabetics and diners-out. Salt and calorie content of the 600 basic foods. ONLY $3

Order from Lear Publishers, Dept. G., 105 E. 15 St., N. Y. 3. Save postage by remitting now. *Refund in 10 days if not completely satisfied.*

TUG-O-WHEEL
COMPLETE GARDENING OUTFIT

No more hard spading! You too can have fine gardens, with less time, less effort (do 10 hrs. work in 1). "TUG-O-WHEEL" does it—all steel outfit plows 5" deep; marks rows 12" to 36" wide; hills, cultivates, destroys weeds; fast, quick, easy; quality fully guaranteed. Free folder tells all. Write
TUG-O-WHEEL HAND PLOW CO.
Dept. O Ballston Spa, New York

Building a Hardy Border

(*Continued from page* 23)

away. I keep the weeds out, add compost, bone meal and more leaf mould. And from April's crocus through daffodils, tulips, daylilies, iris, peonies, roses, lilies, phlox and asters, right on to the last chrysanthemum of November, we have a happy, gay procession, constantly changing, always expected and yet always surprising. Flowers of the right height bloom beside others of harmonizing colors, and a succession of bloom is kept up all season. There is great fun in building a hardy border, especially under somewhat adverse conditions. Of course I still change things a little sometimes. That is part of the fun, too.

HUNGER SIGNS IN CROPS—A Symposium by Firman E. Bear *et al.* (The American Society of Agronomy and The National Fertilizer Association, Washington, D. C. Second Edition, 1949. $4.50)

This book, first published in 1941, received applause on many fronts and has been in such demand that a revised and enlarged edition has been eagerly awaited. The revised edition, like the first, devotes the opening chapter to Why Do Plants Starve? The succeeding chapters are devoted to the causes and symptoms of deficiencies in tobacco, corn and the small grains, potato, cotton, vegetable or truck crops, deciduous fruits, legumes, and citrus fruits. The book is profusely illustrated with colored and black and white cuts. At the end of each chapter is an extensive list of well selected references. Cloth bound, 390 pages.

GREEN GLORY—The Forests of the World by Richard St. Barbe Baker. (A. A. Wyn, Inc., New York, New York. 1949 $3.50)

This book gives a first-hand account of the rapid depletion of forests in many parts of the world. If unchecked, the depletion of the world's forests is bound to lead to serious consequences. GREEN GLORY makes a real contribution to an understanding of how forested areas can be placed on a sustained yield basis. The destruction of forests is the first phase in the devastation of the land. The author has devoted his life to the study of the world's forest re-

GARDENERS' **FIRST CHOICE!**
8 H. P. 12" Model
ONLY $236
F.O.B. Milwaukee

- Tills, Mulches, Cultivates!
- 9 "Plug-in" Attachments for Spraying, Mowing, Hilling, Seeding, Bulldozing, Snowplowing, other work!
- Also 16"—26" tillers and power take-off models!
- Write Dept. OG-4 for folder and detailed information.

MILWAUKEE EQUIPMENT
ME ROTARY TILLERS
SOUTH MILWAUKEE, WISCONSIN
Patented
© 1950 MILWAUKEE EQUIPMENT MFG. CO.

WRITE FOR COLOR CATALOG

Daffodils of NEW GLORIOUS BEAUTY!

Be up to date on the latest, most unusual Daffodil innovations as originated by Dutch hybridizers; browse through new 1950 Nelis Catalog and get the thrill of seeing the showiest, most magnificent Trumpet, Barri, Incomparable and Leedsi varieties pass in review. Color illustrated; finest selection in the Daffodil world. Also newest introductions in Tulips. Catalog ready for May 1st mailing—write for it now.

NELIS NURSERIES
INCORPORATED
204 Lakewood Blvd., HOLLAND, MICH.

★ GRAVELY ★
TRACTOR POWER

GRAVELY MOTOR PLOW & CULTIVATOR CO., BOX 448 DUNBAR, WEST VA.

GET ACQUAINTED OFFER!
HEAVY BEARING, FAST GROWING
BLUEBERRIES

Certified, early, mid-season, late varieties. FREE LITERATURE. Wholesalers, write for prices.

3 PLANTS Bearing Age GUARANTEED ONLY $2.49

GALLETTA BROS.
182 Chew Rd. Hammonton, N. J. Largest in N.J.

BROWNELL ROSES

Everblooming Sub-Zero Hybrid Teas

25 Different Colors and Forms

FRAGRANT

Vigorous. — Beautiful. — Easy to grow. — Large abundant blooms, more constantly. — Comparable with the best.

Can live several decades even after low subzero. *Save replacement expense.* Plants that fail, anywhere, within 2 years, replaced free, purchased from the hybridizers—

Also 20 beautiful yellow and orange hardy Climbers

Send for pictured list

BROWNELL ROSES

52 Rose Park, Little Compton, R. I.

SUPER-COMPOST

Has Gone Over Big!

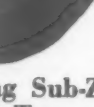
21 months without a complaint. It is something really good to dig into your soil. No waiting for results—it acts at once. Too, it is complete. Nothing else needed. It feeds your plants, and renews your soil. It is a proven product.

Write for literature.

KNAPP & KNAPP

988 Lewelling Boulevard
San Lorenzo, California

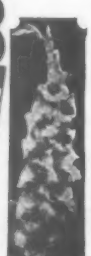
WRITE NOW FOR GOVE'S Gladiolus Book



80 Pages—
Beautiful Pictures

For years a specialist in this most satisfactory of summer flowers, I believe my catalog is the best, largest, most up-to-date book published on Glad Culture.

I list 400 leading varieties—including this year's top introductions, old and new favorites and the best from the WORLD'S leading hybridizers. Many SPECIAL COLLECTIONS of wonderful value. You'll like the 12 Groupings—earliest, tallest, most beautiful, etc. Write today for this big GOVE GLAD BOOK sent anywhere for 6c stamps.



CHAMPLAIN VIEW GARDENS

ELMER GOVE Box G Burlington, Vt.

sources and is well qualified to depict the destruction that has been wrought and the brave efforts of conservationists to replenish the world's supply of trees. The colorful text is well punctuated with dramatic photographs. The author takes his readers on a tour of the planet pointing out the great holes that have been gouged out of the forest belts, and telling them about many famous trees in different parts of the earth. This book is written not only for tree lovers, but for everyone concerned with the welfare of our planet. Cloth bound. 252 pages.

A TRAVELER'S GUIDE TO ROADSIDE WILD FLOWERS, SHRUBS AND TREES OF THE U. S. by Kathryn S. Taylor. (Farrar, Straus and Company, New York, New York. 1949 $3.00)

This book, sponsored by the Garden Club of America and the National Council of State Garden Clubs, lists and identifies more than 700 wildflowers, shrubs and trees which may be seen on the roadsides of the United States. This book makes every roadside your garden to watch and to enjoy. It may serve as a gateway to many pleasant and educational hours. The first part of the book gives an overall picture of the great families of plants, pointing out the most common and representative of each family. There are over 400 marginal drawings, four full color photographs, and complete descriptions with common and botanical names of the roadside plants. The second part of the book includes a chapter to the roadside plants of each state. The chapter begins with a drawing of the state on which are indicated the floral displays each state offers and where they are located. The state flower is also illustrated in the chapter head. The outstanding public parks and gardens are listed. Every gardener and flower lover will find this book a real traveling companion. Cloth bound with 182 pages.

•

The 4 Freedoms on the Farm

(*Continued from page* 31)

and in so doing, we have obtained another priceless boon—the boon of health to our soil, our plants, our animals—and most important of all—to ourselves! We have re-established the "wheel of life" in the soil—we have brought "Creative Medicine" into our very homes!

When all this has been accomplished, we shall receive in abundant measure the answer to Senator Desmond's prayer: "Teach us what we ought to know about our diets—strengthen our food, that it may give its strength to us and to our children."

THE END

PREVENTION

A new magazine will be published under the editorship of J. I. Rodale of ORGANIC GARDENING Magazine, to be devoted solely to the conservation of human health, stressing exclusively the prevention of disease; not the cure for it. The name of the magazine will be PREVENTION. It will be the only magazine of its kind ever published and will be conducted on an extremely high plane. No advertising of medical or health products will be accepted, but PREVENTION will make editorial comment on products which it feels worthy of mention.

Mr. Rodale's first interest was in the field of general health and he was the publisher of Health Guide about eight years ago. This magazine was discontinued so that he could concentrate on his new publication ORGANIC GARDENING, but now, thousands of the readers of this magazine have shown such an interest in health matters, and are continually writing to us for health information which we do not believe to be within the province of the function of a gardening publication, that we feel it necessary to start this new publication, the material for which will be written by experts.

ORGANIC EDUCATION IN THE CITIES—We are starting it for another reason. Through Organic Gardening and The Organic Farmer we are reaching farmers and gardeners, but we have no way of reaching the general public that neither farms nor gardens. In seeking circulation for Prevention Magazine, we will go into the cities. Thus we will have a means of describing the evils of chemical fertilization to a segment of the population that we do not reach at this time, so that they can raise their voices in the strongly-growing movement against chemical fertilizers, poison sprays and preservative poisons in foods.

We want to build the Organic movement stronger and stronger.

PREVENT DISEASE: Do you use aluminum utensils in your cooking, do you use a pressure cooker, do you want a simple method of stopping cavities in the teeth from forming? PREVENTION Magazine will keep you on safe ground with regard to such questions.

The first issue will be out about May 15th. Do not consider this money as a subscription to a magazine, but as a medical fee to enable you to keep posted on the latest discoveries in the field of prevention of disease, and to stay healthy. Better to pay this small fee than to pay the doctor.

Subscription rates—1 year (12 issues) $3.00. You need send no money, we will be glad to send bill.

PREVENTION MAGAZINE
c/o ORGANIC GARDENING, Dept. 4G
EMMAUS, PENNA.

Please enter my subscription for

1 yr. $3 ☐ 2 yrs. $5 ☐ 3 yrs. $6 ☐
4 yrs. $7 ☐ 5 yrs. $8 ☐

Name .....

Address .....

.....

City ..... State .....

POTTED PLANTS HUNGRY?

House Plants Thrive on ActivO!

Just mix ActivO with potting soil—2 to 4 tablespoons per quart of soil . . . or add to soil of plants already potted and growing. See them pep up! . . . Living organisms, minerals, hormones and vitamins in ActivO energize soil; stimulate growth, make more lush foliage, encourage better blooming and richer color. Tonic for sickly plants.

"NEVER SAW SUCH BLOOMING,"

writes garden authority, who mixed ActivO with potting soil for fuchsias. Try it! By all means use it with AFRICAN VIOLETS.

No. 7 size ActivO gives hundreds of plant feedings.

Coupon and more details on page 5. By all means, TURN NOW TO PAGE 5, and send your order for ActivO while you're thinking of it.

BENSON-MACLEAN BRIDGETON 24, INDIANA

COMPOST AS YOU WANT IT

- SCREENED
- SHREDDED
- GROUND
- MIXED
- PILED

Rocks, trash separated. Grinds manure and tough organic matter through rolling screens, wet or dry. Screens fine as wanted through perforated screens. Free compost circular.

W-W GRINDER CORP. Dept. B WICHITA, KANSAS

DRIED SEAWEED

FROM THE COAST OF MAINE

—o—

Our Seaweed is harvested, fresh from the rocks, dried, shredded and packed in bags to provide minerals from the sea for the benefit of your soil.

WRITE FOR PRICES TO

Seacoast Products Co.

EDGEWATER PARK, N. J.

BACK TO NATURE

ACTUMUS Improves your soil the natural organic way

No chemicals, nothing artificial. Promotes normal growth, prevents unhealthy growth. Actumus Fertility Builder (odorless) enriches increasingly. Can be used indoors and out in dry or liquid form for all types of vegetation. It also activates compost heaps quicker and increases its efficiency.

¼ lb. makes up to 375 gallons — $1.25
½ lb. makes up to 750 gallons — $2.25
1 lb. makes up to 1500 gallons — $4.25

at your dealer, or mailed postpaid by

FOREIGN PRODUCTS CORPORATION, Importers
1270 Broadway, New York 1 CH. 4-5494

—with Dr. William H. Eyster

Organic Method in the Sandy Soil of Florida

Q. I am returning to Florida about March 15, and I expect to try my hand at gardening and using your method of fertilizing. I expect to plant about 500 strawberry plants, but since I have no heap and am anxious to get started this spring I would appreciate your recommendation as to how to start. Will you help me get started?

G. J. K., Milwaukee 2, Wis.

A. The simplest and most natural way to start building up sandy soil is to cover it with a fine mulch of mixed compostable materials. As a rule a great variety of such materials can easily be found and collected. A surface mulch of plant materials will absorb and hold water, prevent erosion, keep the soil cool and moist, and serve as food materials for all soil organisms. Perhaps slowly at first, but with increasing rapidity later, the mulch will be digested and become a part of the soil.

Sufficient mulch should be placed on the soil between the strawberry plants to prevent the growth of weeds. If available, a part of this mulch may consist of sawdust.

Organic Raspberries

Q. I have subscribed to Organic Gardening for about 2 years and in this period I have not as yet seen a detailed account of the culture of raspberries.

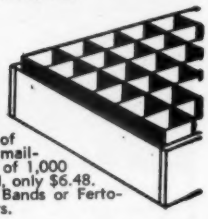
I am interested in starting a good sized patch. I had a small one about 1938 but gradually were all winter killed.

(*Continued on page* 61)

300 WOOD VENEER PLANT BANDS $2.75

If you start your seeds, seedlings, cuttings, etc., in Plant Bands you can have better plants with sturdier root systems; earlier results; no wilt; no setback when transplanted outdoors. Millions used by professional growers. Made of wood, not paper. Size 2x2x2½. They cost so little, too.

300 PLANT BANDS $2.75



or 100 for $1.35 sent postpaid. (West of Ohio or South of Va., mailing 25c extra.) Crate of 1,000 by express not prepaid, only $6.48. Be sure to use Plant Bands or Ferto-Pots for better results.

FERTO-POTS

Sensational invention. Plant "eats" pot. FERTO-POTS are made of a rich cow manure mixture in automatic pot machines and kiln dried. Start seeds, bulbs, plants, cuttings, etc. in FERTO-POTS. Pot and all goes into the ground. No wilt, no setback in transplanting; better results; earlier crops; larger profits. Pots soften up in the moist soil and feed the plants. FERTO-POTS have taken the garden world by storm. Millions sold. Two sizes. No. 2½—100 for $2.75; 250—$5.00, and No. 3—100 for $3.25; 250—$5.75, by express, (not prepaid.) Use FERTO-POTS and enjoy a thrilling new garden experience.

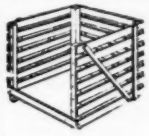
CLARENCE B. FARGO

14 FARGO BLDG. **FRENCHTOWN, N. J.**

FIRST ON THE MARKET *STILL THE LEADER*

The WILLOW GROVE COMPOST BOX

***Does a better job in less time at less expense.* This scientifically designed compost box more than pays for itself with every batch of compost. 4 ft. square in size, it makes over a ton; enough to cover 600 square feet one inch deep.**



The Wil-gro is not just a box, it's a compost box engineered to save you time, labor, space and money. Made of weather-resistant cypress. Ruggedly constructed, yet light enough to be easily handled.

Only **$18.75** *complete plus shipping charges.*

Just the thing for the smaller garden. A compost box that measures only 38 inches square will make a good ½ ton of finely finished compost. Same rugged construction for only $15.75 complete plus shipping charges.

WILLOW GROVE EARTHWORM HATCHERY

E. B. LUCKIE, Prop.

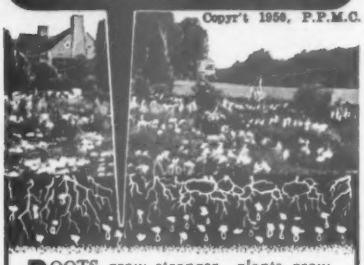
Sumneytown Pike, **Kulpsville, Pa.**

For REAL GOOD EATING PLANT BURKE'S BEST HYBRID SUGAR CORN

Spectacular sweet corn hybrid. Twenty rows of deep, tender, light-golden kernels on 9-inch ears. Flavor you'll never forget. Unsurpassed for the home garden; commands a premium price for market growers. Matures 85 to 92 days. Order seed NOW; supply limited. $1 per lb.; 5 lbs. for $4, delivered prepaid. Folder of new facts for successful growing FREE.

BURKLEIGH CO., Dept. FA, Towson 4, Md.

PREMIER makes soil *alive* gardens *thrive*

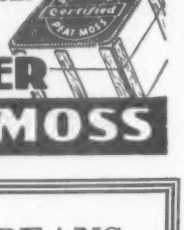


ROOTS grow stronger—plants grow lovelier—in soil conditioned by *Premier Peat Moss.*

Fluffy Premier adds *pure, weed-free, spongy, 97% organic matter* to your soil. It gives substance to light soil—loosens heavy soil—so that roots can spread out. Because of its amazing absorbency, it soaks up as much as *20 times its weight in moisture.* It enables all soil to store water, air and plant food—and release it as needed. Premier also acts as an "appetizer" to stimulate the feeding of roots and the growth of plants.

Give your soil Premier Peat Moss—and your soil will give you the strong-growing lawn and garden you want. Ask your dealer today for Premier Peat Moss—easily identified by the *blue* bale head with the Certified Seal.

PREMIER PEAT MOSS CORP.
535 Fifth Avenue
New York 17, N. Y.



PREMIER PEAT MOSS

Finely Ground
SOYA BEANS

An excellent cover material that may be used with the New Organic Method. One of the best soil improving cover crops known. May also be used to make soya bean meal, a most versatile and nutritious food. No chemical fertilizers were used in growing these beans.

50 lbs.	$2.75
100 lbs.	$4.50

F.O.B. Mt. Holly, N. J.

FREDERICK PHILLIPS
Jobstown New Jersey

MICHIGAN PEAT

Enriches, vitalizes your soil. Used on government plantings, parks, etc. Unequalled for lawns, azaleas, roses and flowers. At leading dealers or send $1.00 for trial bag postpaid.
Michigan Peat, Inc., 267 5 Ave., N. Y.

Growing Strawberries Successfully

(*Continued from page 35*)

and other types of small leaves. Ground leaves would be excellent. Watch out for chopped hay. It carries too many weed seeds. We learned this to our sorrow one season and raised the finest patch of lush weeds you ever saw. Chopped or hammered straw is fine. Some use rice hulls, almond shells and other materials. Whichever material you use, put it on liberally between rows and plants. At least two inches deep is not too much to use. The idea is to have a top mulch which will conserve as much moisture as possible yet allow rain to penetrate through. Also the weeding and cultivating problem is almost a thing of the past then. The fine root system, which in the case of a strawberry is rather shallow, is not disturbed. The angle-worms take care of the tilling for you. We would suggest a top dressing of compost under this first mulch. Where plantings are left for two or three years it is advisable to add to this mulch each spring. If most of the previous year's mulch is worked and tramped into the soil, it is well to loosen the top soil and to use another application of compost before re-mulching.

The results of following a top mulch plan in your strawberry beds will be as follows. Bigger and sweeter fruit. Double and in some cases more in the yield of berries. Fruit will be firmer. No amount of rain will mud-spatter your berries. After the first six weeks you can say good-by to hoeing and cultivating. In irrigated areas you will use a third of the formerly used amount of water. Your soil will not erode and all in all you will be a much happier and satisfied grower of strawberries.

In closing, let me cite a personal experience that verified results. Two beds of equal size were set last spring to Gem everbearing strawberries, one being mulched with fir and pine needles and the other left unmulched. An average picking from the unmulched patch would be around three crates. The mulched patch produced in the vicinity of eight crates of superior berries. This spring we sold around $300 worth of plants from the mulched bed. We sold no plants from the unmulched bed, as they had root rot lesions on the roots. This spring (1949) we mulched the latter mentioned patch. From it we had some of our best berries this past season and the younger runner plants now are almost all free of disease. We plan next spring to rotary till out the old rows and leave a row of the naturally set plants for our new rows. This is an experiment and we believe it will work.

SEMINAR—WEEDS

(*Continued from page 52*)

that your soil is somewhat acid. You can greatly discourage it by applying lime and phosphate rock to your soil. The plant can be used as green matter for the compost heap. Liming and cultivating the soil are sufficient measures.

Q. What can I do about horsetails?

A. Horsetails grow from underground stems. They can be controlled by clean cultivation or by covering the soil with a smother mulch.

Q. Can you direct me to someone who can tell me something about nut grass, what it likes, and what it dislikes?

A. Nut grass is really a sedge. It is a perennial and propagates itself by producing scaly tuber-bearing rootstocks. The stem is rather stout, the leaves from 2 to 3 inches wide, and the flowers are borne in a compound or nearly single umbel. Like all sedges, it prefers wet soil. It dislikes most a well-drained soil. It can be controlled by proper drainage and by the removal of the rootstocks by proper tillage methods.

PLANTING TIME

Don't plant too early. Only hardy plants can get a start in cold, wet ground from which the frost has not entirely disappeared. Make several plantings of the same crop to insure a steady table supply. Many vegetables have to be harvested as soon as they mature to be really good. Don't plant too much of one crop and don't stop after you've harvested your early crops. There's still time to grow rutabagas, late corn, winter beets, turnips, endive, Chinese cabbage, late bush lima. etc.

—o—

SUNLIGHT

Tomatoes, squash, carrots, cucumbers and other plants in your garden require a good six hours of sunlight. Be sure they are not in the shade of trees and shrubs, and that your garden catches the sun's rays. Leafy vegetables like lettuce and spinach may have to be shaded in warm weather.

—o—

TOADS

Many people falsely associate toads with warts. Treat toads as your friends. They live exclusively on insects. Some expert gardeners even "import" toads. They'll find their own food and housing, but it doesn't hurt to keep shallow containers of water handy if there's no water near by.

—o—

CAULIFLOWER SEED

Cauliflower seeds are expensive, and almost twice the amount is necessary in sowing cauliflower as in sowing cabbage. For example, a 100-foot row will require two packets of cauliflower seed but only one packet of cabbage seed.

NON-RUST WIRE

For garden supports, for fastening name tags to plants, for other similar purposes, aluminum clothesline wire has been recommended. It doesn't rust and is practically indestructible.

—o—

HEELING IN TREES RECEIVED EARLY

Plants received too early for planting should be heeled in sand, moist peat moss, moist weathered sawdust, or soil that is not frozen. The packing should be removed from bundles of trees and each tree separated so that when heeled in there will be no air spaces between the roots. This will keep them in good condition until the ground is ready so that they may be planted permanently.

—o—

SUCCESSION CROPS

If you plant a short-season crop, follow it in the row with another. Plant spinach after lettuce, and lettuce after spinach. Plant snap beans and turnips after peas; endive, kale, beets or Chinese cabbage after the first crop of snap beans.

—o—

POLE BEANS

Pole beans may be grown advantageously on poles that have been set with their tops tied together in tepee fashion. This gives the individual poles added support. They are not as likely to lean in every direction as the season progresses,

SEED SOER 50¢
You will love it - properly distributed seed goes twice as far - saves thinning. For peas to petunias. Cork of 6½" x 1" plastic tube pivots in palm - tap gently. *SATISFACTION GUARANTEED.* Prepaid -- 2 for $1 bill
GRO-QUICK CO., 361 W. Huron St., Chicago 10, Ill.

COLLOIDAL
FOR THE LAND'S SAKE
SOFT PHOSPHATE
NATURALLY FINER THAN ROCK CAN BE GROUND
Containing 14 Trace Elements
The Fastest Acting Mined Product in History . . . .
TENNESSEE & FLORIDA ROCK—All Grades
"Organically Recommended"
HOOVER SOIL SERVICE
Phone 70 GILMAN, ILLINOIS

MULCH with MUL-Tex
to 1-Hold soil moisture
2-Smother weeds
3-Eliminate need for cultivation
Is the sun stealing vital moisture from your garden? MUL-TEX (non-absorptive buckwheat hull mulch) lets rain through and holds it beneath—keeps sun from drying out ground.
Ideal for flower beds, gardens, lawns, shrubs. Dark brown color gives rich background, especially for roses. 200 lbs. will cover 260 sq. ft. one inch deep. Convenient 50 lb. bags.
PRICES: 200 lbs. $5.00—500 lbs. $10.50—1000 lbs. $19.00—2000 lbs. $35.00 all f.o.b. Cohocton. Order from this ad, or send for free descriptive folder.
LARROWE MILLS, INC.
BOX 1 COHOCTON, N. Y.

"Chel's Plant Mineralizer"
—*source of safe potash*
Pulverized granite rock, an important source of many nutrient trace elements, is offered for organic gardening methods in the growing of all good things of the earth. For name of nearest dealer, prices and descriptive leaflet, write to:
Chel's Natural Mineral Plant Food Company
P. O. Box 2023 Boston, Massachusetts
DEALER INQUIRIES INVITED

SOIL LIFE
An acid compost of natural organic materials and colloidal minerals.
Prepared especially for: Blueberries, Strawberries, Evergreens, Azaleas, Holly, African Violets, Potatoes, etc., and all vegetation preferring a decidedly acid soil. Wood land odor, screened and air-dried for easy application.
Large trial bag — prepaid $1.00
100 lbs. — $2.50 500 lbs. — $11.25
½ ton — $20.00 1 ton — $35.00
F.O.B. Bridgeville, Pa.
Your soil problems gladly answered.
Send ½ lb. of your soil for free pH test.
J. A. PORTMAN, JR.
R. D. No. 1 BRIDGEVILLE, PA.

SENSATIONAL OFFER!
1000 WORLD FAMOUS
RAINBOW MIX
GLADIOLUS BULBLETS!
$1.49 POST PAID
PRIZE WINNERS make this the outstanding "buy" in Gardening America, at a price you never dreamed possible. All have a full life ahead, to give you flowers for years to come. All cash orders sent postpaid. We start shipping about March 15th.
OUR SUPPLY IS LIMITED!
Extra! Prompt orders will receive the latest copy of "PASTIME GARDENING"
PASTIME GARDENS
5950 Shuman, Garden City, Mich.

Enjoy PERENNIALS
For a more beautiful garden plant a variety of hardy perennials and rock garden plants. Include famous Pitzonka's Pansies by trying our special offer below.
Pitzonka's Cut-Flower Mixture
50 plants ..... $2.75 ppd.
Send 25c in coin for new Pansy and Perennial catalogs in color.
Pitzonka's Pansy Farm, Box 648, Bristol, Pa.

CAMELLIAS
over 350 varieties
Rhododendrons & Azaleas
"The finest"
See our specials
Write for new free colored catalog
PORTLAND CAMELLIA NURSERY
3307 N. Williams Ave. Portland 12, Ore.

DELIGHTFUL FLOWERS
Our illustrated catalogue, sent on request, offers seeds of the less usual flowers in annuals, rock garden and border perennials, house plants, and the like.
REX. D. PEARCE
Dept. D Moorestown, N. J.

CHINESE, ENGLISH & AMERICAN
HOLLY
22 ENGLISH VARIETIES
HARDY NAMED STOCK
Send for FREE CATALOG
The WILMAT HOLLY CO.
Box 384-A, NARBERTH, PA.

FOR THE JOY OF ORGANIC GARDENING
ActivO makes rich, activated compost-fertilizer quicker, better, easier, cheaper from waste.. leaves, garbage, etc....(reduces garbage without odor!)...Activates, conditions and sweetens soils... Many other uses. Organic. Bacterial. Odorless. Trial size for 425-lb. compost, No. 71-1025, $1.00.
SEARS, ROEBUCK & COMPANY Catalogs

Start Your Difficult
GARDEN SEEDS
with the
SPROUTMASTER
Write for free literature.
WESTERN NUTRITION LABORATORIES
6 ORANGE STREET, REDLANDS, CALIFORNIA

WHITE BIRCH Trees 20 FOR $3.50 Postpaid
16 to 24 in. Seedlings sent postpaid at planting time. Hardy all climates. Write Box 15-D for Evergreen Catalog.
MUSSER FORESTS, INC., Indiana, Pa.

giving the garden a neglected appearance.

—o—

WHITE CAULIFLOWER

Some people like their cauliflower white. For pure white cauliflower, tie the outer leaves together over the head as the head is beginning to form. Be careful, though, not to draw the leaves down so tightly that ventilation will be cut off and the head decay.

—o—

CHINESE CABBAGE

Chinese cabbage has a venerable history and may be the father of the long-headed cabbage. It is beginning to become very popular with gardeners. It is very good as a salad crop, and the thinnings may be used as greens. It requires cool weather, plenty of moisture, and a fertile soil. In warm, dry weather and in poor soil, the plant goes to seed. It must therefore be gathered early in the summer or in the fall.

—o—

MOLES

Common garden moles are carnivorous not vegetarian. Their principal diet consist of earthworms, grubs and various insects—in the adult and larva stages. Some species of moles feed continuously and their digestive processes are such that they can starve to death twenty-four hours after having eaten a capacity meal.

—o—

STARTING PLANTS IN THE HOUSE

Quart wax milk cartons can be used to start tomato and other plants, in the house. Dry the cartons thoroughly to make for easier cutting. Cut the cartons to the height of a fruit lug. Twenty will fit snugly into a fruit lug. Fill cartons within one inch of top with sifted soil and proceed to plant. When it comes time to transplant, water plants thoroughly, cut out bottoms of cartons and then slit sides. Handle carefully. The roots will have matted and hold the soil. The top half of the milk carton should be retained, as it can be used to cover a "treat" of early vegetables that often come up before the danger of frost is past.

Vitamins, Growth Substances, Hormones to the Soil

(*Continued from page* 37)

Another plant-growth hormone is called necrohormone. This is produced in healing wounds. When it is extracted from beans which contain it (*Phaseolus vulgaris*) it is called traumatin (trauma—wound). This hormone stimulates all kinds of division, particularly in the bean pod itself. 0.1 part per million of it is enough to be effective.

The effect of enzymes is also enhanced by vitamins, as can be observed with yeast and other microorganisms. Biotin (for yeast) and thiamin play the most important roles here. Both together sometimes have a stronger influence than when used alone; the concentrations used are remarkably low. Studies on *Rhizobium trifolii* (a symbiotic nitrogen fixing bacteria) in cultures showed that under the given experimental conditions, the control with a vitamin free medium produced 5 million bacteria in 21 days. If 70 parts per million of thiamin were used in addition, the count was 60 million. With an addition of 0.5 ppm of biotin, the count was 7 Million; with 0.5 ppm biotin plus 70 ppm thiamin, the count was 1500 Million. In a dilution of 1:100 Billion, the acting force can still be detected, while the optimum effect is at a dilution of 1:2 Billion. While we are used to seeing such figures in our national debt and government spending, we will have to re-learn our agricultural practices in order to make proper and successful use of this interesting new knowledge.

Readers' Correspondence

I would like to inquire if you have any information and instructions on their culture; in particular the fertilization, pruning, staking, if they need be staked, variety, the place to get food and disease-free stock, also if they can be propagated from the original stock.

I have been told that one of the reasons for my plants winter killing is that I got too much Fall growth and the new tender canes could not stand the cold winter here. I did not prune them back in the Fall and some grew to six feet, and in the Spring the canes didn't bud at all.

If you have anything on this I would appreciate it, as I am planning to start a patch this Spring.

R. N. L., Concord, N. H.

A. You will find the help you need in The Berry Book which you can get from Organic Gardening.

It is important that raspberries make their seasonal growth early in the season so that the canes harden sufficiently to withstand freezing temperatures before winter. After the plants have finished fruiting, the old canes should be cut out at ground level. From four to six of the best new canes should be allowed to grow during the summer and fall. As a rule it is best to delay pruning until after freezing temperatures of winter are past.

Raspberries respond especially favorably to compost which has been fortified with phosphate and potash rocks. Mulching the plants with shredded plant materials is far better than cultivating for the control of weeds and soil moisture.

—o—

How Can Water be Conserved in the Soil?

Q. I have been a much interested reader of your magazine for a number of years. I am trying to apply your recommendations as far as possible, and have some very convincing evidences.

My soil is known as the Chalfont flaggy silt loam. The underlying bed of clay seems to prevent much ab-

(Continued from page 57)

sorption of rain moisture, with a consequent run-off. As a result the late summer is very dry and my well supply is so limited that I cannot use water for my vegetation or compost. The result is that my compost is too slow and incompletely decomposed.

Under these conditions is the recommended shallow plowing justifiable? My thought is that most roots cannot penetrate the clay unless it is broken up by deeper plowing.

Another problem confronts me in supplying the necessary plant food. We can get Nitrogen from the air through the legumes. We can get raw phosphate rock by paying the excessive freight.

But how can we supply potassium in a form consistent with the organic methods?

Wood ash, of course, is the simple suggestion but also the practically unobtainable material.

H. C. M., Weisel, Penna.

A. You should, first of all, break the hardpans in your soil. This can be accomplished with a subsoiler or by growing deep-rooted leguminous cover crops in the soil. By breaking the hardpans, increasing the humus-content of the soil, and keeping the soil covered with a protective mulch, the rain water will be absorbed and drained down into the subsoil as reserve or storage water to be used by the crop during the summer months. Gradually your soil will hold more water, and your well will have a continuous and generous supply of water. Water is one of the most important natural resources and should not be allowed to escape as surface water.

Minerals which have been leached out of the soil can be restored by adding suitable applications of pulverized phosphate rock and finely ground potash rock. In addition to phosphorus and potash, these rocks contain such minor elements as iron, magnesium, manganese, and sulphur and a long list of the essential trace elements.

Raise RABBITS!

Commercial producers needed everywhere. Big income for full time, or supplement present endeavor in spare time. We teach you. Send 25c for bulletin, prices, hutch plans, etc. Get into this industry now.

RABBIT FEDERATION
200 Burrell Building, Dept. G
San Jose, California

ASK FOR SOILSERVICE and BENSON MACLEAN Garden Materials
Ruhm Phosphate Rock—America's Great Soilbuilder 80 lb. bag $2.25 — Ton $32.80 both freight collect
Activo—America's Great Soil Conditioner & Activator No. 5 Trial Size $1.50 (prepaid within 300 miles) No. 25 Size $6.99 with composter plans (prepaid within 300 miles) No. 50 Large Size $11.95 with composter plans freight or exp. collect. Use these two great products and don't accept any substitutes.
SOILSERVICE TOWNSEND, MASS.

Hand Modeled Pottery

Baked in original wood fired kiln. Colors in mellow green or brown. Traditional Pennsylvania Dutch design. Order catalog today for all types of useful novelties.

POWDER VALLEY POTTERY
45 S. 17 St. Allentown, Pa.

FRUIT & NUT TREES — 47th QUALITY STOCK

Fruit, Nut trees and Gladiolus Bulbs, Berry plants, Roses, Fig and Shade Trees, Shrubs, etc. Send for 48 page free catalog.

Tualatin Valley Nurseries SHERWOOD, OREGON

Interested in learning to
WRITE?

Let these three books start you off on the right path . . .

The Word Finder
by J. I. RODALE
Speedily builds bare thoughts into expressive sentences. *Much more useful than a thesaurus!* 1350 double-column pages, thumb-indexed. **$6.50**

The Word Bank
by S. BASESCU
A new type of synonym book. Quickly helps you find the *right* word. Invaluable for building your vocabulary. 216 pages. **$3.00**

Short Story Writing
by F. ORLIN TREMAINE
Step-by-step guidance by popular editor and author. Includes complete short story with analysis. Adopted by U. of Vermont. 240 pages. **$3.50**

Postage prepaid when cash accompanies order.
RODALE PRESS, Dept. 4-G, Emmaus, Pa.

ORGANIC GARDENING BUTTONS may now be obtained through the ORGANIC GARDENING office. These attractive bronze buttons with green enamel border are excellent for garden clubs or individual use. Price 50c.

OFFICIAL ORGANICULTURE EMBLEM

Organic Gardening, Emmaus, Pa.

J. I. Rodale's

Editorials on Cancer

are available in the back issues of Organic Gardening. Be sure not to miss these eye-opening articles on food, chemicals, and cancer. All issues available from June '49. 25c per copy. May and June cancer editorials available in a single pamphlet for 25c.

ORGANIC GARDENING

Emmaus Penna.

It's a sensation!

The Organic Method on the Farm

by J. I. RODALE

HERE is a 128-page booklet that for the first time provides farmers with a program for instituting the organic method.

Included is a description of the odorless, laborless type of chicken house in which odors are controlled by bacteria, and from which the droppings need be cleaned out only once in six months.

Various methods of compost-making on a farm scale are discussed. Information is given for both field crops and orcharding.

Third edition, revised. Generously illustrated. Price $1.00.

ORGANIC GARDENING

Dept. 4-G, Emmaus, Pa.

Build Your Organic Gardening library with back copies. All 1948-'50 issues available except May and Dec. '48; Jan., April, and May '49. 25c ea.

ORGANIC GARDENING, Emmaus, Pa.

Read all about

PREVENTION

the new health magazine to be published by

Organic Gardening

See ad on Page 56

Classified Ads

Rates are 2¢ a word. Minimum 25 words, or $5.25. Payable in advance. Include name and address in word count. (Deduct 15% from total rates, for Help or Positions Wanted ads.)

FLOWERS

TUBEROUS BEGONIAS in all their glorious colors. We offer the best tubers and plants. Send for free folder. **BLACKWOOD BEGONIA GARDENS, 1817-0 E. 4th, Superior, Wis.**

BEGONIAS Free list now ready including Tuberous, Fibrous, Rex, and all new crosses. Send for it today. **D-VISTA GARDENS, 3225 D St., Salem, Ore.**

DAHLIAS—Green Plants and Cuttings. New, Old and Australian Varieties. Send for list. **HANNA DAHLIA GARDENS, Dept. H, 812 S. Delsea Drive, Clayton, New Jersey.**

DELPHINIUM, Pac. Giant, Prizewinner, also imported seed of finest Primroses, Columbines, Swiss Giant Pansies. Free Folder. **OFFERMAN DELPHINIUM GARDENS, 4709 W. Stevens, Seattle 6, Wash.**

5000 Mixed Colors GLADIOLUS BULBLETS $1.00, 40,000 $6.00, 150,000 $20.00 all prepaid. BREWER SONS NURSERY, 138 Vine, Harrisburg, Pa.

LARGE Flowering GLADIOLUS 25 large sized bulbs, state inspected, containing 10 varieties $1.00 postpaid. **ELLEN D. BROADHURST, Hollcong, Penna.**

QUALITY GLADIOLUS—Grown on virgin soil where Glads never grew before. Collection of 100; two inch bulbs, $4.00; one inch, $2.00; No. 4 blooming size, $1.50. Free Catalog describing nearly 200 varieties. **GLADVALE GARDENS, Walnut, Ill.**

GLAMOURIZE YOUR GARDEN WITH HY-LAND GLADS. EXOTIC MIXTURE. Medium $3.49; small $1.98; 1000—$12.00 all prepaid. Organically grown. **HY-LAND FARMS, Hammonton, N. J.**

TRULY GORGEOUS GLADIOLUS—mostly jumbo—NEW EUROPE bright red, PAUL RUBENS rich purple, EARLY DAWN soft rose, MASKERADE glossy yellow, red blotch, MAJUBA velvety scarlet, 5 bulbs of each variety $1.95—10 of each $3.65—20 of each $6.95 labelled, guaranteed, prepaid. Add 10% west of Mississippi River. Remit with order please. No catalog. **JOHNSON BROS.; Union Ave; R. D. No. 2, Somerville, N. J.**

GLADIOLUS—Deluxe Assorted Rainbow Collection (30 varieties) 100 large bulbs $4.95 postpaid. Our new, colorful, 48 page catalog lists and describes 200 varieties of top quality gladiolus with culture tips. Send for it today. **ALFRED L. MOSES, 53 Lake, Lima, New York.**

100 BLOOMING SIZE GLADIOLUS BULBS, in about 50 gorgeous colors, $2.00; 200 bulbs, $3.50, all postpaid. Write for free catalog featuring many outstanding new varieties. **TAYLOR GARDENS, Ware, Mass.**

IRISES OF DISTINCTION. The world's finest direct from our gardens to you. Free Catalog. **EASY BREEZE GARDENS, Route 3, Box 204-0, Yakima, Wash.**

IRIS—Rainbow Special 50 mixed all colors (2 each 25 varieties unlabeled) for $2.00 Postpaid. **FREE** catalog "World's Largest Collection" Iris, Peonies & Perennials. **IRIS, Box 01, Beloit, Kansas.**

IRIS—10 beautiful Iris including the magnificent Iris Klondyke Gold $2.50 postpaid. if ordered before May 1st one extra. Catalog free. **SUNSET VIEW IRIS GARDENS, Constantine, Mich.**

ORCHIDS: Anyone can grow our Calanthe Orchids. No special soil or extra care. Succeed right with your African violets or ferns. Each plant bears spray of eight to twelve beautifully colored orchids. Fully mature, blooming size plants with full instruction Two Dollars each, three for Five Dollars, delivered to you. **CHARMAINE GARDENS, Lakeland, Florida.**

GROW ORCHIDS for pleasure and profit. Our Free circulars give information on growing these beautiful and interesting Flowers. **FRANKLIN GAMBLE,** Orchid Grower. **Mill Valley, California.**

PANSIES—Steele's Jumbo pansy plants. Largest flowered, most beautiful pansies grown. $2.00 per 100, postpaid. $15.00 per 1000, express collect. **WARD'S PANSY GARDENS, Route 3, Macon, Georgia.**

PELARGONIUMS. Fuchsias. Carnations. Geraniums and Potted Plants. 40 New 1950 Introductions. New descriptive catalog of over 400 varieties. 6 labeled plants $2.65 postpaid. **HORNER'S NURSERY, 1335 E. 16th St., National City, Calif.**

BARNHAVEN'S FAMOUS HARDY PRIMROSES. easily grown. Elizabethan forms, beautiful modern Polyanthus, miniatures. Himalayans and fragrant "Dusty Millers" from the Alps. Illustrated catalog upon request. **BARNHAVEN, Gresham, Oregon.**

ORGANICALLY GROWN ROSES. Save room in your garden for our organically grown roses. Each plant shipped in at least 10 pounds of earth, express prepaid. First time offered. Prices same as dormant plants. Sold in groups of four. Write for information. **GREAT VALLEY MILLS, R.F.D. 5, Ivyland, Bucks County, Penna.**

RUSSELL LUPINS—The flowers your neighbors will admire. Beautiful Colors. Gold Medal Winner of the Royal Horticultural Society. Grow your own from our selected seed. 40 seeds—25c, 200 seeds—$1.00. **H. E. MOELLER, Bridgeport, Mich.**

RED EMPEROR. Huge, bright red tulips, extremely early, blooming with your daffodils. One of the largest and showiest tulips grown. **OUR SPECIAL PRICE 12 for $1.25,** postpaid. Write for 1950 hardy bulb catalog. **FLORAVISTA, Route 3, Box 869-X, Olympia, Wash.**

Strong Transplanted—VIOLAS: Blue, Red, White, Apricot, Yellow; Giant Pansies, 25 $2.00 prepaid. 50 Giant flowering snapdragons $3 prepaid. Big list potted annuals, Summer Bulbs, etc. **WARD,** Plantsman, **Hillsdale, Michigan.**

NURSERY STOCK

SPECIAL REDUCED PRICES IF ORDERED FROM THIS AD! Three and four year old Fruit Trees many of which have already borne fruit in the Nursery row: Apple—Red and Yellow Delicious, Jonathan, Wealthy; Peach—the large Diamond King, Hale, Hale Haven, Elberta; Apricot—Moorpark, Early Golden; Pear—Seckel, Sugar, Bartlett, Duchess; Burbank Peach Plum; Governor Wood Sweet Cherry. All trees 4-5' high; $5.00 trees reduced during this special sale now—$2.50 each; per dozen—$25.00. Small budded Peach, one year Apple trees as low as $15.00 per 100. **EGYPTIAN NURSERY CO., Dept. O.G., Farina, Ill.**

BABY EVERGREENS — SEEDLINGS — TRANSPLANTS — SEEDS. Azalea - Rhododendron Hybrids. All Northern-grown. Bulbs. Free Catalog. **GIRARD BROS. NURSERY, Geneva, Ohio.**

NURSERY STOCK. Robinson, Temple, Premier Strawberry Plants, 100-$1.95; 300-$4.95; 1000-$9.95. Cumberland Raspberry and Eldorado Blackberry Sprouts, 2 yr. old $.10 each 100-$8.50. Giant size blooming Flower plants, Pansies, English Daisies, Myosotis, 12-$1.00; 50-$3.00. **A. WILEY McDONALD, Jr., New Freedom, Pa.**

RHODODENDRON (carolinianum), Rhododendron-Maximum, Kalmia (laurel), Hemlock (Tsuga). Heavily rooted. Spg. moss packed. Assorted as desired. 3-4 Ft. 100, $26.50; 50, $16.00; Dozen, $5.50. **PREPAID. NATURE'S GREENHOUSE, Tallulah Falls, Ga.**

GRAPE VINES 2 year 50c each. $5 doz., postpaid. Write for prices in quantity. Rose bushes $1 each, other nursery stock. **IRA H. BOST, Rose City Nursery, Maiden City, N. C.**

EVERGREEN LINING-OUT STOCK. Transplants and seedlings. Pine, spruce, fir, Canadian hemlock, arborvitaes, in variety. For growing Christmas trees, windbreaks, hedges, forestry, ornamentals. Prices low as 2¢ each on quantity orders. Write for price list. **SUNCREST EVERGREEN NURSERIES, Dept. OG, Johnstown, Pennsylvania.**

25 Latham RASPBERRY, Bearing Size. World's Best $3.00 Minnesota Highly recommended Fruit Trees, Grapes and Chrysanthemums. **CATALOG FREE. FULL OF BARGAINS. SWEDBERG NURSERY, Battle Lake, Minnesota.**

BOOKS & PUBLICATIONS

FREE..SEND for FREE LIST of BOOKS on HEALTH, DIET, VEGETARIANISM, Nature Cure. We can also supply books on all subjects and in all languages. **AMERICAN LIBRARY SERVICE, 117 West 48 Street, Dept. G, New York City, 19.**

"ORGANIC HUSBANDRY"—Summarizes best Organic literature, $1.00 (clothbound, $2.00); "Wheel-o'-Life" Vitamin Charts, $1.00; Health Leaflets 5c, List mailed. **BRENN, 250 Ayer, Williamsville, N. Y.**

NEW DIFFERENT HEALTH JOURNAL. Benefits organic gardeners. **Samples 25c. HEALTH REFORMER, Box 72, Redlands, California.**

GARDENERS' BOOKS, books for nurserymen, American, British (many British authors endorse organiculture), in print and old. Lists. **HORTICULTURAL BOOK SERVICE, 212 Detroit Avenue, Concord, California.**

"HONEY AND YOUR HEALTH" by Bodog F. Beck, M.D. and Doree Smedley. A book for those who seek the natural foods for health. $3.00 a copy Postpaid. **CLINTON KEAGY, New Castle, Penna.**

"MAKE YOUR OWN WINE" by Alex Appleyard; from flowers, vegetables, hard and soft fruits and many others. Over a hundred recipes. $1.50 postpaid. **CLINTON KEAGY, New Castle, Penna.**

"MIRACLES OF MENTAL ACTION." Tremendously useful, vital facts. Thousands sold. Price $1.00. **SATISFACTION GUARANTEED. SCIENTIFIC INFORMATION SERVICE, 2259 Houghton Ave., SE, New York 61.**

"CRUDE BLACK MOLASSES" Read this remarkable book by Cyril Scott. Sufferers of arthritis, high blood pressure, weak heart, ulcers, varicose veins, moles, haemorrhoids, fistula, gall stones, etc., will marvel at this natural "Wonder-Food". One Dollar Postpaid. **CLINTON KEAGY, New Castle, Penna.**

GARDEN EQUIPMENT

DELIGHT. PLEASURE. Fulfillment of gardening dreams. You win at every turn with our incomparable weeding tools—three of them that make you king on your plot of ground. **FREE:** Circular on tools and 8 page discussion of weeds and weeding. Write **KRAMER COMPANY, Dept. 15, Enumclaw, Washington.**

EARTHWORMS

DAVID'S FOLLY EARTHWORMS will build topsoil for your gardens, lawns, roses, and trees. Order now for spring planting. **DAVID'S FOLLY EARTHWORM FARM, West Brooksville, Maine.**

DR. OLIVER'S Hybrid **EARTHWORMS** $2.50 per 500 Prepaid. Our aim—Satisfied Customers. Instructions Free. **KEYSTONE EARTHWORM HATCHERY, 15 N. 30th, Harrisburg, Pa.**

SELL EARTHWORMS for soil fertility and for profit. We ship under your name if desired. Particulars free. **EARTHWORMS FARMS CO., 6220 Ridgeview Avenue, Baltimore 6, Maryland.**

GARDEN SUCCESSFULLY WITH EARTHWORMS. WRITE now for FREE instructions and EXCITING OFFER. **CAPITAL EARTHWORM FARM, Dept. O, 2514 Fourth Street South, Arlington, Virginia (CH 4121)**

DOMESTICATED WORMS are real investments to workers in small fruit; less work, more profits. **Mrs. WM. J. GROTH, Chesterfield Worm Farm, Route 7, Richmond, Va.**

TRY REJUVENATED EARTH. Earthworm Castings, Soil Fertilized Nature's Way 35c per No. 2 Can, $1.00 for 3 No. 2 Cans. Approx. 1½ lbs. per Can. Hybrid Earthworms 200 for $1.00. Approx. ½ lb. per Container. Prices Prepaid Add Postage. **JAM and PAM ORGANIC FARMETTE, 1705 Central Ave., Augusta, Ga.**

"EARTHWORM NEWS", "PROPAGATION & USE", many valuable circulars, secrets of 15 years' experience, **FREE.** Write for all-time LOW prices now effective. Start successfully, easily. **CALDWELL, Barwick, Georgia.**

SOILBUILDING and Fishbait EARTHWORM BREEDING UNITS: Instructions with cypress breeding box containing food and 500 domesticated red breeder worms. $10. delivered. **HOLLY-OAKS, Lloyd, Florida.**

EARTHWORMS. Save on Fertilizer cost. Follow Nature's Way. For Soil Building and Better Composting. Write for descriptive folder. **COOLVILLE EARTHWORM FARM, Coolville 2, Ohio.**

EARTHWORMS—Hardy outside pit raised earthworms. Guaranteed alive on delivery. Price and information sent on request. **DR. BATES and TRAPP WORM FARM, 2424 Sullivant Ave., Columbus 4, Ohio.**

HARDY EARTHWORMS raised in outdoor pits. Hand Picked, counted and packed with food for two weeks. Live delivery guaranteed. Write for prices. **FLOYD WICKELL, Mt. Sterling, Ohio.**

EARTHWORMS—Use that famous earthworm developed by the late Dr. Oliver. Free instructions on how to use and raise them. **MIAMI VALLEY EARTHWORM FARM, 109 E. Beechwood Ave., Dayton 5, Ohio.**

MODEL BOX SETUP, including 600 Soilution earthworms with capsules and culture, $7.00. Fine for beginners. Large starter, $1.25. Complete instructions. **NATURE'S SOIL BUILDERS, 1544 Spring Garden, Lakewood, Ohio.**

TO OBTAIN the most from your soil, use **Earthworms.** Folder and new special offer sent on request. **EDMONDSON HATCHERY, 118 Mirabeau St., Greenfield, Ohio.**

MODEL BOX SETUP, including 600 mature Soilution earthworms, capsules and culture, $7.00 Prepaid. Fine for beginners. Breeders, 200—$2.00. Instructions. **NATURE'S SOIL BUILDERS, 1544 Spring Garden, Lakewood, Ohio.**

BETTER COMPOST, better soil, better growing conditions are obtained by using our scientifically bred soilution earthworms. Write for free folder. **GREENFIELD WORM HATCHERY, 15703 Biltmore, Detroit, 27, Michigan.**

DUNG or RED ORCHARD WORMS for better growth of plants, shrubs or trees. Use vigorous worms to build best compost. Instructions with shipment. C.O.D. in U.S.A. 1000—$4.50, 5000 or over $4.00—1000. **R. C. ALLEN, 1129 Cooper St., Jackson, Michigan.**

EARTHWORKERS—Breeder box run culture of domesticated Earthworkers for your compost heap, garden or laboratory. Culture includes breeders, baby worms and capsules—range 1200 to 2000 worms per gal., plus capsules. $6.00 per gal. Cash with order. Offer good until May 1, 1950. **G. V. HABERMEHL, Swartz Creek, No. 1, Mich.**

OZARK WIGGLER EARTHWORMS. They will survive transplanting in any soil, write for descriptive literature and prices. **LAKE-HAVEN EARTHWORM HATCHERY, East 7th Street Road, Box 130-B, Joplin, Missouri.**

DIXIE WORM FOOD. All Organic. English Red and Red Wigglers Love It. Mix in Compost Heap or apply as mulch direct to Soil. Excellent results under new organic Method. Contains over ten Minerals, vitamins and Enzymes needed by Animals and plants. Information leaflet with each order. $5.00—100 lbs. $77.00 Ton F.O.B. Birmingham. Remit to **DIXIE WORM FOOD, P. O. Box 4092, Birmingham 6, Ala.**

RED WIGGLERS hand picked—1000 $5.00, 3000 $14.00, 5000 and over $4.50 per 1000. Canada add 50c per 1000. Prompt prepaid shipments payable in advance. **LAMBERT WORM RANCH, 2751 Poplar St., Memphis, Tenn.**

English MANURE WORMS, Satisfied customers say they're best of all. Convert green manure, garbage, directly into Humus without composting. Free pamphlet tells why. 500-$3.00, $5.00 thousand postpaid. **PHILLIPS WORM FARM, Box 22, Bessemer, Ala.**

DOMESTICATED EARTHWORMS to build your waste materials into organic rich soil. Call or write **Mrs. L. JONES, 1515 E. 76th, Seattle 5, Wash.**

"HARNESSING THE EARTHWORM." Life story of the author, "An Earthworm Turned His Life," mailed free. Write **DR. THOS. J. BARRETT, Dept. 24, Sun Valley, Calif.**

TURN YOUR COMPOST and fertilize your soil with **"SOULE'S SELECTIVE SOILBUILDERS"** 500 breeders $4.00, $7.00 per thousand prepaid. **SOULE HATCHERY, Oceanside, Calif.**

FERTILIZERS—SOIL CONDITIONERS

HEALTH CONDUCING Colloidal Minerals for soil or compost culture. Over twenty elements. None toxic. Nutrition from the ground up. **"BRABON" RESEARCH for HEALTH, Telford, Pa.**

AFRICAN VIOLETS bloom continuously when planted in **SANLODEB.** Plant foods or repotting will not be necessary for 3 years. 3 lbs., $1.00 postpaid. $1.15 west of Mississippi River. 30c lb. for each lb. over 3 lbs. **S. E. DEBERRY, 611 So. Main St., Washington, Pa.**

POULTRY MANURE: 100 lbs. in 50-lb. bags $2.00; 500 lbs. in 50-lb. bags $9.00; 1000 lbs. in 50-lb. bags $16.00; 2000 lbs. in 50-lb. bags $25.00. **DIAMOND STATE EVERGREEN CO., Milton, Del.**

HOW TO MAKE YOUR OWN SOILMIXTURE AND RE-POT HOUSEPLANTS. New booklet describes soilmixture for over 50 of the most common houseplants. A helpful, easy guide for anyone interested in having healthy and beautiful house plants. One dollar. Money back guarantee if not satisfied within 5 days. **EBMYD, Thiensville, Wisconsin.**

Tennessee ROCK PHOSPHATE in any quantity. Get our prices and literature. **H. R. LeFEVER, R. 1, Spring Grove, Penna. (At Stoverstown, York County).**

IF YOU WISH to replenish the fertility of your soil with ground phosphate rock, write for information. **MIDWEST PHOSPHATE COMPANY, 405-6 D'Arey Building, Joliet, Illinois.**

CLEVELAND, OHIO AREA Gardeners. Ruhm's Phosphate Rock, small or large quantities on hand. **W. F. SCHMITT, 28669 Lorain Rd., North Olmsted, Ohio.** Phone TR 1-2578.

RUHM'S PHOSPHATE ROCK. Good for the soil, and for earthworm, and for livestock. For information write to **H. F. SCOTT, Domville, Ont., Canada.**

AMERICA'S GREAT SOILBUILDER, Ruhm Phosphate Rock, has no substitute. "It's its' fineness that does it". Don't accept coarser Tennessee or Florida grindings. Insist on guarantee 85% through 300 mesh sieve with 90,000 openings per square inch. Get the facts. **SOILSERVICE, Townsend, Mass.**

LEAFMOLD

OAK LEAFMOLD $20.00 per bulk ton F.O.B. "Gathered from old oak forests". **EARL DILATUSH'S HOLLY FARM, Highway 25, Robbinsville, N. J.**

FOODS

IF YOUR ARE looking to natural products for better health from highly nutritious concentrates, try 18 **D-F,** Superior Food Supplement containing 18 necessary vitamins and minerals required by the human body. For further particulars and literature write **DR. WALTER H. JENKINS, 902A 20th St., NW, Washington, D. C.** Distributors Territory open.

INDIAN RIVER CITRUS FRUIT. Grown and selected with fullest possible care in regard to humus soil-content, quality of root-stock and other important factors of goodness. Per bushel, express prepaid to average distances: Valencia oranges, $5.65; seedless grapefruit, $5.75; half of each, $5.70. Honey (not shipped separately): 5 lbs. $1.25; 1 lb., $.30. **SCHUYLER JACKSON, Wabasso, Florida.**

Unprocessed, unsulphured DRIED FIGS, Peaches, Pears, Apricots, neither sprayed nor chemically fertilized. Delicious natural Halowi Dates, Almonds, Cashews, Olive Oil. Request prices. **S. H. JAFFE (C), Lakeside, California.**

HONEY: Delicious Florida orange blossom, 2½ lbs. postage paid $1.00. 10 lbs. postage paid $3.75. **NELSON L. WHEELER, St. Cloud, Florida.**

DIRECT FROM THE MOUNTAINS. Wild flower honey. As the bees left it. Nothing added or removed. Healthful, tasty and nutritious. Six pound can prepaid $2.38. **DAVID J. JOHNSON, Clarenden, Pa.**

Tap Nature's richest ORGANIC food-mine. Try **COL-I-GEN,** The **MARINE-MOSS** Organic Iodine combined with **COLLOIDS.** Derived directly from deep-sea vegetables; a **PURE NATURAL ORGANIC. NUTRITIONAL RESEARCH ASSOCIATES, 233 Robinson St., Binghamton, N. Y.**

SESAME SEED—Hulled—Natural, flavorful, easily digested alkaline food. Rich in organic minerals, superior protein. 3 lbs. $2.00 (postpaid). **NATURAL NUT PRODUCTS, 613 Washington Ave., Brooklyn, 16, N. Y.**

EARTHWORMS
MADE ME BEAUTIFUL

And earthworms can make your flowers more beautiful and your fruits and vegetables taste better. These small creatures work day and night to increase the productivity of your garden. Dry **EARTHWORM CASTINGS,** house-plant food, $1.00 qt.; $2.75 gal. Dry **BASIC MIXTURE** for indoor culture of Earthworms, $3.00 for 5 gal. can. **WRITE TODAY** for instructions and complete price list. More and better earthworms per dollar at

Stow Earthworm Farm
KENT . OHIO

NOW—anyone can
RAISE WORMS

Send for your "WORMS UNLIMITED" pamphlet that tells why and how earthworms can be raised for pleasure and profit. No charge — no obligation — just send your name to

POLSON ENTERPRISES
1108 Leland Ave. Chicago 40, Ill.

EARTHWORMS
Soil's Greatest Asset
WRITE FOR LITERATURE and PRICES
ROMAC EARTHWORM FARM
BOX 375 ASHLAND, OHIO

Get the Best for Less
at prices everyone can afford!
Soilution Earthworms
Write for our new reduced price list.
COLORADO EARTHWORM HATCHERY
2134 DECATUR ST. DENVER 11, COLORADO

Read
"Our Friend the Earthworm"
Learn the importance of earthworms in gardening.
ORGANIC GARDENING, Emmaus, Pa.

More Important Than Ever:
Binders
for your valuable copies of Organic Gardening

All the news, features, editorials, to which you look forward every month can be preserved in these handy, durable, attractive leatherette binders—instantly ready for you to consult. A file of *Organic Gardening* is a permanent encyclopedia of organiculture, health, and inspiration.

New-size binders: $1.50.
Old-size binders: $1.25.
Binders for Organic Gardening Library Booklets: $1.25.

Each binder holds 12 copies—easily inserted and removed. Stamped in gold on front and backbone. *Be sure to specify which binder you want!*

ORGANIC GARDENING
Dept. 4-G, Emmaus, Pa.

ORGANIC IRON

Builds richer red blood

Organic Gardening readers will be particularly interested in this natural product—useful in maintaining blood iron balance to prevent nutrition iron deficiencies often associated with that tired lack of energy feeling that so often troubles so many men and women. This remarkable iron product is different from the usual run of inorganic astringent often-constipating iron compounds. HEMOLASSES Tablets (the name of this natural iron product) is derived wholly from food sources. Hemoglobin for blood iron. Super "B" Yeast for natural B Complex and to prevent "B" deficiencies plus liver, bone marrow, chlorophyll, dehydrated molasses and folic acid. Nothing else ever offered exactly like it. It's good for you.

180 Tablets (month's supply) $4.50
½ size $2.50

At better Health food stores or postpaid direct.

BIO-BRANDS Dept. OG-4B Jersey City 3, N. J.

PURE RAW WHEAT GERM

AUTHORITIES SAY: That RAW, unprocessed wheat germ is a rich natural source of the miracle vitamin E, and of vitamins and organic minerals vitally needed to give resistance to infection, to promote robust digestion, to stimulate appetite. They say these vitamins and minerals are necessary for mental alertness and vigor, to aid proper blood regeneration, cell restoration, to stimulate normal replacement of cells that are worn out and thereby delaying senility. With our RAW WHEAT GERM these vitamins and organic minerals are at their greatest potency. Why not be sure you have the best? Take advantage of this special 'Get Acquainted' offer of 2½ lbs. of Pure Raw Wheat Germ for $1 Postpaid. If you order promptly, we will send you a valuable 32 page Whole Grain recipe book. FREE LITERATURE!

WHOLE GRAIN FLOUR MILLS

Dept. OG-4 2611 Jones St. Chicago 47, Illinois

GRIND YOUR OWN WHOLE GRAIN FLOUR

and you will know that it contains no agene or other preservative or chemical. The flavor alone will tell you how much better it is. A postcard will bring full particulars.

LEE ENGINEERING COMPANY
Milwaukee 3, Wisconsin

SUNFLOWER SEED

Jumbo Shelled Sunflower Seeds
rich in Vitamin E—Ready for the Vitamin E hungry
American Public
2 Lbs.; $2.50 4 Lbs.; $4.75
***The* GREAT VALLEY MILLS**
R.F.D. 7, Ivyland, Bucks County, Penna.

SUNFLOWER SEED

ORGANICALLY GROWN

Large screened	10 pounds	$4.50
Medium screened	10 pounds	$3.50

(Prepaid)

C. J. DEBBINK
Route 2, Oconomowoc, Wis.

QUALITY FRENCH PRUNES

Health food—unprocessed—tree run sizes—no chemicals or commercial fertilizers—full of sugar—distinctive flavor—larger and better—30c per pound in minimum ten pound lots or more—charges *prepaid* anywhere in U. S. A.—no C.O.D.'s.

A. C. MARSH
926 Shannon Road Los Gatos, Calif.

WHEAT GERM

VivaTa HEALTH Full FOODS

Natural Source of Vitamin B & E, organic minerals, protein, lecithin, amino acids. Vitamins B and E are necessary for Normal Nerves, Heart, Digestion, Energy. 2 lbs. $1.00 prepaid anywhere in U. S. Write for Free Price List and Circulars.

VEGETABLE PRODUCTS CO.
Box 1204L, Syracuse, N. Y.

FREE LIST of Health Foods..Specials, such as SUNFLOWER SEED, fine granules, 20 oz. $1.00; GARLIC-PARSLEY ('Anti-gas') tablets 60c. and $1.00; 250 ALFALFA ('Alkaline influence') tablets $1.00.; 15 oz. Whey powder for the colon flora $1.00.; FORTIFIED SEA KELP:100-$1.00; AMINO-VITAMIN MIX $2.50; and other specials. "SCHIFF BIO BRANDS," Jersey City 3, N. J.

For Better Health Use HARRISON SESAME SEED PRODUCTS. Nature's Digestible Complete Protein Rich in Calcium, Vitamins and Lecithin (a nerve fat). FRESHLY HULLED HIGH-LECITHIN SESAME SEEDS (50-53% fat content). 3 Lbs. $2.00. Postage extra. FRESHLY HULLED SUNFLOWER KERNELS Lb. $1.75. Postage extra. Rich in Vitamins and minerals. Hulled Millet 2 Lbs. $1.00. Postage extra. Write for price list. HARRISON ORGANIC FOODS, 1028 E. Landis Ave., Vineland, N. J.

NEW-CROP MAPLE SYRUP. Quart $2. Half-gallon $3.50. Gallon $6. f.o.b. FOREST FARMS, Jamaica, Vermont. Little two-ounce sugar book sent free with "The Maple Sugar Book". 288 pages. $3.75 postpaid.

TROPI-PAYA TABLETS—Aid to Digestion—Derived entirely from fresh Papaya. No binders, no fillers. Month's supply $1.65 Postpaid. State distributors wanted. MacDONALD SALES COMPANY, 1500 E. Colorado, Glendale 5, Calif.

VITAMINS AT LARGE SAVINGS—All brands. Special reduced prices on natural high potency Vitamin A and Vitamin E. Write us your needs. LEVITT DRUGS, Box 718-0, Woodmere, N. Y.

WE MILL Stone ground Whole Wheat, Cornmeal, Millet, Soy flour unbleached White. Sell hand flour mills, Shredding Devices, Juicers. GROSE, Box 699, Lodi, Calif.

"WHOLE FOOD" Shop. Buffalo Area. Compost-grown, non-preserved foods; "Osterizer" (food blender) $39.50; seed sower $1.00; glassware; etc. List mailed. 250 Ayer, Williamsville, N. Y.

VEGETABLE PLANTS

ONION PLANTS—Choice Select Yellow or White Sweet Spanish, Yellow or White Bermudas. Satisfaction guaranteed or money refunded. Shipping daily until June. 300, $1.15; 500, $1.50; 1000, $2.50; 3000, $4.25; 6000, $8.00, prepaid. AUSTIN PLANT COMPANY, Box 313, Austin, Texas.

SEEDS

Aunt Mary's SWEET CORN and Edible Soy Beans. 1 lb. 60c; 2 lbs. $1.00. Postpaid. Burpee's Mammoth Zinnias, Hibiscus Pkt. 20c. EDWIN SOUDER, Telford, Pa.

GRASS SEED

Plant MIDGET GRASS. Never needs cutting. Nothing finer for lawns, slopes, banks, cemetery graves, stone walks. Free circular. MIDGET GRASS CO., 3370 No. 53rd St., Milwaukee, 16, Wisconsin.

BEEHIVES

BEEHIVE Factory selling direct saves you 25% on best grade equipment. Carloads in stock. Free Catalog. WALTER KELLEY CO., Dept. OZ, Paducah, Kentucky.

POULTRY

DUCKLINGS, Goslings, eggs, breeders. Safe Shipment anywhere. Bulletins, magazine on hatching, raising, selling. PEYTONS DUCK and GOOSE FARM, Route 2DO, Duluth, Minnesota.

STATIONERY

UNIQUE INFORMAL STATIONERY. Twenty original drawings by 20 artists of Lehigh Valley. Fitting for all purposes. Size 3" x 4". Postpaid $1.25. MRS. WILLIAM H. STEUGERWALD, 213 S. 17th St., Allentown, Pa.

BUSINESS OPPORTUNITIES

For Information about MELBOURNE VILLAGE, a planned community of productive homes and creative living with special emphasis on Organic Gardening, write AMERICAN HOME FOUNDATION, Box 686, Melbourne, Fla.

RAISE BULBS FOR PROFIT. Tremendous demand. Marketing services. Write MISSION HILL GARDENS, Box 224, Ashtabula, Ohio.

FREE Book "505 Odd, Successful Businesses." $250 Week reported! Work home. Expect something Odd! PACIFIC, Oceanside, Calif.

DISTRIBUTE SUBSCRIPTION-GETTING BOOKLETS. Help spread the organic message. Nothing to sell. Merely hand out these booklets to likely subscriber prospects of Organic Gardening Magazine. Coded coupon permits us to trace source of subscription to your efforts. Liberal commission. See page 2 for complete story.

REAL ESTATE FOR SALE

FARM FOR SALE. 40 Acres. 26 acres in good Alfalfa. 240 ft. poultry building. Dwelling, Modern conveniences. Deep well. Write for particulars. MARY R. GROSS, New Egypt, N. J.

REAL ESTATE—WANTED TO BUY

RETIRED Man with wife and child would like to rent about five acres of good soil, with small house in East or Central Texas. Preferably from person interested in Organic methods. Address: JOSEPH SATZ, 625 N. Brittania St., Los Angeles, 33, Calif.

MONEY MAKING ACTIVITIES

FREE Book "505 Odd, Successful Businesses." $250 Week reported! Work home. Expect something Odd! PACIFIC, Oceanside, Calif.

IRISH WOOLENS

CAPES are pleasantly enveloping garments, especially IRISH SHOOTING CAPES made of AVOCA HANDWOVEN IRISH TWEED. Jackets; topcoats. Tweeds by the yard. CAROL BROWN, Importer, Putney 27, Vt.

MISCELLANEOUS

CLOGGED and OVERFLOWING CESSPOOLS and Septic Tanks are a health menace. No need to employ expensive pumping methods. Simply apply 100 lb. drum of SUR-SOLVENT to reduce the solid content and clean the pores in the ground surrounding the cesspool, thereby allowing the proper leaching of the water. Write for descriptive literature and how to start fermentation in your cesspool or septic tank. ELECTRIC SEWER CLEANING COMPANY, 294 Lincoln St., Allston 34, Mass.

HOBBY CATALOG 10c. Reptile List 5c. Hamsters $2.75 pair. Alligator $2.50. Chameleon 35c. Box turtle 75c. Baby Turtle 35c. Mealworms 50c hundred. Dozen Midwest Cacti $1.25. QUIVIRA SPECIALTIES, Topeka, Kansas.

WHY DO walls get dirtier, why more sickness in winter? What to do about it? Worth writing a postal to know? Inquire. F. MAGIERA, Heating Expert, 177 Hill St., Detroit, 3, Michigan.

VACATIONING

MAKE YOUR next Summer's VACATION inexpensive. Exchange your house or apartment with another reliable family. Plan now to see another part of the country. For information write to HILDRETH FINN, 103 Summer St., Springfield, Vermont.

HELP WANTED

NURSERYMAN with knowledge of growing cut flowers organically for commercial use. Steady job with good salary and a future. Give experience and reference in first reply. P. O. BOX 2731, West Palm Beach, Florida.

WANTED: MAN with background in Health Matters to aid in editing a Health Magazine soon to be published in Allentown, Pa. Would have to move to Allentown. Write BOX HM, ORGANIC GARDENING, 46 S. West St., Allentown, Pa.

If you wish to buy or sell organically-grown foods send advertising copy to Organic Gardening, 46 S. West Street, Allentown, Pa. The purpose of the Trading Post is to bring together the buyer and seller of organically-grown food products. Rates are 2½c a word. Minimum 25 words, or $5.25. Payable in advance. Include name and address in word count.

ORGANIC TRADING POST

HULLED LARGE SEEDED MILLET. Grown without chemicals. An excellent breakfast food. Price $1.30 for five pounds. Postpaid in 5 lb. lots. OSCAR H. WILL & CO., Box 600, Bismarck, N. D.

Bio-dynamic (organic grown) **Whole Wheat FLOUR and CEREAL** Stoneground. 5 lbs. $1.—plus postage. Ask for Free copy of "Does Bread Nourish." WALTER BUSCHMAN, Juniper Farm, R. D. 1, Chester, N. Y.

ORGANICALLY GROWN WHEAT processed into 100% whole wheat and cereal containing all the original vitamins and mineral salts of the wheat berry. Trial 5 lb. bags of flour or cereal sent postpaid for $1.00. LOU-HELEN RANCH, Davison, Mich.

WANTED TO BUY:

WANTED TO BUY—Organically raised vegetables, fruits, eggs, chickens in or near Los Angeles. M. C. ADLER, 7402½ Arizona Ave., Los Angeles 45, Calif. Phone—Orchard 12444.

The Trend is The Organic Way

These ORGANIC GARDENING Books and Booklets Show You the *Why* and *How!*

Vital Publications for Organic Gardeners

AN AGRICULTURAL TESTAMENT
by Sir Albert Howard, C.I.E.
The standard textbook for all who want to change over to home-made organic fertilizers. 253 pp. **$3.50.**

•

THE SOIL AND HEALTH
by Sir Albert Howard, C.I.E.
Food problems can be solved only by restoring to the soil its virginal fertility. Most farmers are soil bandits. A remarkable follow-up to "An Agricultural Testament". 320 pp. **$4.00.**

•

MAKE FRIENDS with Your Land
by Leonard Wickenden
A knock-out blow to chemical fertilizers. Illustrated, 144 pp. **$2.50.**

•

NUTRITION AND THE SOIL
by Dr. Lionel Picton
Scientific evidence that nourishing food comes only from crops and animals raised organically. 400 pp. **$4.00.**

•

BIO-DYNAMIC Farming & Gardening
by Dr. Ehrenfried Pfeiffer
Describes in detail how to convert an ordinary farm into a bio-dynamic farm. Paper, 240 pp., 18 illus. **$1.75.**

•

PAY DIRT *by J. I. Rodale*
The best guide to the organic movement. Points the way to proper gardening methods. 252 pp. **$3.00.**

•

THE COMPOST GARDENER
by F. C. King
An English gardener explains his system of organic gardening. Foreword by Sir Albert Howard. Paper, 100 pp. **$1.00.**

•

EARTHWORMS—Their Intensive Propagation
by Dr. Thomas J. Barrett
Complete, practical working directions for breeding, feeding, growing, and harvesting. Paper, 60 pp. **$1.00.**

THE ORGANIC GARDENING LIBRARY

Popular paper-covered, pocket-size booklets

1. **THE DOCTORS' ATTITUDE TOWARD FERTILIZERS.** What they think of the organic method. Contains transcript from U. S. Senate Hearing. 60c
2. **MANUAL OF ORGANIC MATERIALS. A Comprehensive List of Compostable Materials Occurring in the Home and in Industry.** This book alphabetically lists 85 substances that may be used to keep the soil fertile in Nature's way. It defines the composition of each material and what each substance contributes in plant nutrients to the soil. . 50c
3. **BULBS AND HOUSE PLANTS** by Cecile Matschat. Discusses tulips, iris, lilies, peonies, etc. 60c
4. **ANNUALS AND PERENNIALS** by Cecile Hulse Matschat. Describes the advantages of annuals over perennials and vice-versa. . . 60c
5. **HOUSE AND GREENHOUSE GARDENING** by Fred McCready. Deals with inexpensive means for growing plants in your house and under glass in hot-beds and greenhouses. . . $1.00
6. **GARDENING WITH THE EXPERTS.** An encyclopedia on all phases of gardening. . $1.00
7. **THE WAR IN THE SOIL** by Sir Albert Howard, C.I.E., M.A. A magnificent summary of the organic cause for those who desire to change from ordinary to home-made organic fertilizer. . . 80c
8. **SEEDLINGS** by Evelyn Speiden. How to start seedlings—how to prepare the garden. . $1.00
9. **VEST-POCKET VEGETABLE GUIDE** by Roger W. Smith. How to grow 40 vegetables in the organic manner—for medium northern climate. 25c
10. **COMPLETE MODERN GARDEN HERBAL** by Robert O. Barlow. Many facts about herb gardening and usage in several lands. . . $1.00
11. **THE FRUIT ORCHARD** edited by J. I. Rodale. Practical hints, unusual data on fruit growing. 50c
12. **LEAVES AND WHAT THEY DO** by Heinrich Meyer. For every gardener and lover of plants. 45c
13. **SUNFLOWER SEED—THE MIRACLE FOOD** by J. I. Rodale. Treatise on how to grow, how to eat this vitamin-rich food. . . . 50c
14. **WEEDS AND WHAT THEY TELL** by Ehrenfried Pfeiffer. Discusses hundreds of weeds common to farm, orchard and garden. . . $1.00
15. **SHRUBS AND TREES** by Cecile Matschat. Landscape design, borders and backgrounds, street trees, flowering trees, fruit trees, evergreens, etc. 60c
16. **HOW TO MAKE A GARDEN** by Cecile Hulse Matschat. Here are all the facts and underlying principles to make any garden a success. Illustrated. 65c
17. **PLANNING THE HOME GROUNDS** by Cecile Matschat. Whether you buy or build . . . remodel or start from the ground up, this book will help you develop a beautiful setting for your home. . 65c
18. **HOUSE PLANTS—How To Grow Them** by P. T. Barnes. A complete guide for growing healthy vigorous plants in the house. . . 50c
19. **TEN TRUSTWORTHY TROPICAL TREES** by John C. Gifford. A delightful book. Includes the lime, coconut, guava, avocado and mango. . $1.00
20. **WILD GARDENS OF NEW ENGLAND** by Walter Prichard Eaton. How to reproduce natural settings of wild flowers in your garden. . . $1.00
21. **GARDENING FOR PROFIT** by Peter Henderson. Originally published in 1874. Reveals many profitable secrets for present-day gardeners. . $1.00
22. **QUICK-RETURN METHOD OF COMPOST-MAKING** by M. E. Bruce. New ideas for producing compost WITH OR WITHOUT manure. $1.00
23. **TREE CROPS** by J. Russell Smith. An inspiring book on trees yielding crops as animal food. 75c
24. **EDIBLE PLANTS OF THE POND AND WATER GARDEN** by G. L. Wittrock. A wonderful instructor for the nature-lover and fisherman. . 50c
25. **THE FORMATION OF VEGETABLE MOLD THROUGH THE ACTION OF WORMS** by Charles Darwin. The most important parts of his classic on the earthworm, with other articles. . 60c
26. **OUR FRIEND THE EARTHWORM** by George S. Oliver. Deals with the importance of the earthworm to gardening. . . . $1.00
27. **ANIMALS AND THE GARDENER** by Richard Headstrom. Animals and insects that are friends and foes to the garden. . . . 35c
28. **LUTHER BURBANK** by Roger W. Smith. Plant breeding and the important contributions of this great horticultural pioneer. . . 35c
29. **QUESTIONS AND ANSWERS ON COMPOST** edited by J. I. Rodale and Heinrich Meyer. A guide for compost-making. . . 35c
30. **COMPOST—HOW TO MAKE IT** edited by J. I. Rodale. The only book of its kind. . 35c
31. **SLEEP AND RHEUMATISM** by J. I. Rodale. Simple rules for avoiding stubborn conditions of neuritis caused by pressures exerted during sleep. 35c
32. **NATURAL BREAD** edited by J. I. Rodale. Discusses health-giving values of breads and cereals made with organically-grown stone-ground grains. 35c
33. **DEBATES IN HOUSE OF LORDS.** Deals with the advisability of forming a Royal Commission to check on the Howard method of farming. . 45c
35. **FLOWERS FOR EVERYONE** by Heinrich Meyer. Facts about common plants of the garden. 40c
36. **THE GARDEN NOTEBOOK** by Alfred Putz and J. W. Johnson. Proper methods and practices for all types of gardening. . . $1.25
37. **THE GLADIOLUS BOOK** by William M. Joki. All about the gladiolus and its culture. . $1.00
38. **THE BERRY BOOK** by M. B. Cummings, Ph.D. If you grow, or intend to grow, berries, this book is worthy of your attention. . . 80c
39. **FLOWER CALENDAR** by Dr. W. H. Eyster. Tells what to plant and when to do it. Assures a blooming, beautiful garden all year round. . $1.00
40. **THE VEGETABLE CALENDAR** by Dr. W. H. Eyster. Climate maps and extensive tables; month-by-month chart of sowing and harvesting. $1.00
41. **THE ORGANIC METHOD ON THE FARM** by J. I. Rodale. Large-scale composting; odorless, laborless chicken-house; field crops and orchards. $1.00

BINDERS for Organic Gardening Library Booklets. Each holds 12 books. Copies easily removed. **$1.25**

•

SPECIAL OFFERS

A FREE binder with every order for $10 worth of Organic Gardening Library Booklets.

The entire series of 40 books, mounted in 3 binders, value $31.80: ONLY $25!

Postage prepaid on domestic cash orders. Canada and Foreign add 10% for shipping charges.

Send your order direct to ORGANIC GARDENING, Emmaus, Pennsylvania

Build a Library of Gardening Books via the Organic Gardening 20% DISCOUNT PLAN

Here's how you benefit:

When you order the *Organic Gardening* Book of the Month, *plus at least one additional book* listed at the right, *you get a* 20% DISCOUNT *on your entire order.* This is your opportunity to build a helpful Organicultural library at unusually low cost. *Note*: Discount Plan orders for the April Book of the Month will be accepted only during April and May 1950. No C.O.D.'s on this special offer, which is open only to *Organic Gardening* subscribers.

The Book of the Month for April is

Stone Mulching in the Garden

by J. I. Rodale

Opens whole new vistas in gardening and farming and further develops the science of organic composting. (*Not a treatise on rock-garden techniques.*) As worked out at the Rodale experimental farm, the stones are laid in strips with space between for composting. Stone-mulches not only keep down weeds but retain heat and moisture. The result is far sturdier plants than those not so treated. This is a practical method of increasing the health and yield of vegetables, berry bushes, and fruit trees. It is labor-saving and productive, weed-dispelling and attractive. 168 pp., 50 photographs. **$3.00.**

O 12 50 1YR 512651 FWF
LIBRARY
PURDUE UNIVERSITY
LAFAYETTE IND

Example of the Discount Plan:

If you purchase "Stone Mulching" and "Memoirs of a Rose Man," you take the 20% discount on $6.00 and pay only $4.80—a saving of $1.20! *The more books you buy when you buy the book of the month, the greater your cash saving.* And at the same time you are adding helpful, fascinating, authoritative books to your library, all written or endorsed by J. I. Rodale, editor of *Organic Gardening.*

MAIL YOUR ORDER TO

BOOK OF THE MONTH DEPT.

Organic Gardening

EMMAUS, PENNSYLVANIA